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Maternal Mortality in Hospital Practice

BY

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THIS paper is an analysis of 141 consecutive deaths in the Belfast Maternity Hospital, Townsend Street, and the Royal Maternity Hospital, Belfast, during the 10 years 1927 to 1936.

During this period the writer has held successively the posts of house surgeon, resident medical officer, registrar, and assistant surgeon to these hospitals, so that this review is based on first-hand information and an intimate knowledge of all the cases concerned. It was prepared as the writer's evidence for the Maternity Services Committee set up by the Government of Northern Ireland in 1937.

The cases treated by the Belfast and Royal Maternity Hospitals are divided into two classes: (1) antenatal cases, i.e. patients who have attended the antenatal clinic of the hospital; (2) emergency cases, i.e. patients who have not attended the antenatal clinic of the hospital, and for whom the hospital can only accept responsibility from the time of their admission.

Table I shows the cause of death, the parity of the patients, the total number of deaths due to each cause, and the percentage of the total for which each cause was responsible.

Table II shows the mortality rate per cent of cases treated.

Table III shows the maternal mortality rate per 1000 live births for the hospitals during the years 1927 to 1936.

Table IV shows the maternal mortality rate per 1000 live births

TABLE I.

Cause of death	Para					Total	
	1	2	3	4	5 and over	No.	Percentage of total
Puerperal sepsis	12	8	2	6	5	33	23.4
Obstetric shock and post-partum haemorrhage ...	10	3	4	1	5	23	16.3
Eclampsia	14	—	—	—	1	15	10.7
Cardiac disease	5	3	1	—	6	15	10.7
Acute yellow atrophy of the liver	6	—	—	—	—	6	4.3
Pneumonia	3	1	1	—	1	6	4.3
Tuberculosis	4	—	—	1	—	5	3.6
Acute anaemia of pregnancy	2	—	2	—	1	5	3.6
Pyelo-nephritis	3	—	1	—	—	4	2.8
Chronic nephritis	1	—	—	1	2	4	2.8
Hyperemesis gravidarum ...	3	1	—	—	—	4	2.8
Pre-eclamptic toxaemia ...	2	—	—	—	2	4	2.8
Accidental haemorrhage ...	1	—	—	—	2	3	2.1
General peritonitis, other than puerperal sepsis ...	1	1	—	—	1	3	2.1
Asthma	2	—	—	—	—	2	1.4
Rupture of the uterus ...	1	—	—	—	1	2	1.4
Tonic contraction of the uterus	—	—	—	—	1	1	0.7
Pyonephrosis	1	—	—	—	—	1	0.7
Cortical necrosis	1	—	—	—	—	1	0.7
Pulmonary embolism ...	—	1	—	—	—	1	0.7
Thyrotoxicosis	—	—	—	1	—	1	0.7
Mediastinal tumour	—	—	—	—	1	1	0.7
Debility and inanition ...	—	—	—	—	1	1	0.7
Total	72	18	11	10	30	141	100.0

for (*a*) the Belfast and Royal Maternity Hospitals; (*b*) the County Borough of Belfast[1], and (*c*) Northern Ireland[2].

The figures for Northern Ireland include deaths from "Total Puerperal Diseases" and "Non-Puerperal Diseases or Causes combined with Pregnancy and Childbirth (not classed as Childbirth)".

Of these 141 patients who died in the hospitals 40 had attended the hospital antenatal clinics.

The cause of death in these 40 cases was as follows: obstetric shock and post-partum haemorrhage, 12; puerperal sepsis, 6; acute yellow atrophy of the liver, 4; pneumonia, 3; heart disease,

TABLE II.

Maternal mortality rate per 100 *cases.*

Year	Antenatal cases			Emergency cases			Total cases		
	Number of cases	Maternal deaths	Mortality rate	Number of cases	Maternal deaths	Mortality rate	Number of cases	Maternal deaths	Mortality rate
1927 ...	1291	1	0.08	323	6	1.86	1614	7	0.43
1928 ...	1212	2	0.17	286	6	2.10	1498	8	0.53
1929 ...	1129	2	0.18	279	2	0.72	1408	4	0.28
1930 ...	1009	2	0.20	249	8	3.21	1258	10	0 79
1931 ...	823	4	0.49	252	12	4.76	1075	16	1.49
1932 ...	897	8	0.89	225	9	4.00	1132	17	1.50
1933 ...	1174	4	0.34	257	8	3.11	1431	12	0.84
1934 ...	1423	7	0.49	384	15	3.91	1807	22	1.22
1935 ...	1314	6	0.46	559	18	3.22	1873	24	1.28
1936 ...	1560	4	0.26	668	17	2.54	2228	21	0.94
Total ...	11832	40	0.34	3482	101	2.90	15324	141	0.92

TABLE III.

Maternal mortality rate per 1000 *live births.*

Year	Antenatal cases			Emergency cases			Total cases		
	Live births	Maternal deaths	Mortality rate per 1000 live births	Live births	Maternal deaths	Mortality rate per 1000 live births	Live births	Mater. nal deaths	Mortality rate per 1000 live births
1927 ...	967	1	1.03	234	6	25.64	1201	7	5.83
1928 ...	937	2	2.13	192	6	31.25	1129	8	7.09
1929 ...	880	2	2.27	169	2	11.83	1049	4	3.81
1930 ...	745	2	2.68	131	8	61.07	876	10	11.42
1931 ...	591	4	6.77	138	12	86.96	729	16	21.95
1932 ...	697	8	11.48	109	9	82.57	806	17	21.09
1933 ...	791	4	5.06	124	8	64.52	915	12	13.11
1934 ...	1065	7	6.57	142	15	105.63	1207	22	18.23
1935 ...	1057	6	5.68	304	18	59.21	1361	24	17.63
1936 ...	1219	4	3.28	418	17	40.67	1637	21	12.83
Total ...	8949	40	4.47	1961	101	51.50	10910	141	12.92

Comparison of the figures for antenatal and emergency cases is interesting.

TABLE IV.

Maternal mortality rate per 1000 *live births.*

Year	Belfast and Royal Maternity Hospitals			County Borough of Belfast	Northern Ireland
	Ante-natal cases	Emergency cases	Total cases		
1927	1.03	25.64	5.83	3.75	6.52
1928	2.13	31.25	7.09	4.58	6.51
1929	2.27	11.83	3.81	4.78	6.26
1930	2.68	61.07	11.42	4.65	6.06
1931	6.77	86.96	21.95	5.69	6.58
1932	11.48	82.57	21.09	5.5	6.38
1933	5.06	64.52	13.11	5.2	6.63
1934	6.57	105.63	18.23	6.4	8.0
1935	5.68	59.21	17.63	6.1	7.12
1936	3.28	40.67	12.83	5.7	7.3

TABLE V.

Nothern Ireland.

Deaths of women in pregnancy and childbirth, 1927–36.

Year	Deaths from diseases of pregnancy, childbirth and the puerperal state (classed as childbirth)						Deaths from non-puerperal diseases or causes combined with pregnancy and childbirth (not classed as childbirth)	
	Puerperal sepsis		Other puerperal diseases		Total puerperal diseases			
	Number	Rate per 1000 births	Number	Rate per 1000 births	Number	Rate per 1000 births	Number	Rate per 1000 births
1927	48	1.80	80	3.00	128	4.80	46	1.72
1928	39	1.50	97	3.74	136	5.24	33	1.27
1929	37	1.46	88	3.46	125	4.92	34	1.34
1930	39	1.51	98	3.79	137	5.29	20	0.77
1931	43	1.67	89	3.47	132	5.14	37	1.44
1932	39	1.55	95	3.78	134	5.34	26	1.04
1933	41	1.67	92	3.74	133	5.41	30	1.22
1934	55	2.17	104	4.10	159	6.27	44	1.73
1935	55	2.22	81	3.27	136	5.50	40	1.62
1936	58	2.24	99	3.82	157	6.06	32	1.24
Total	454	1.78	923	3.61	1377	5.39	342	1.34

3; tonic contraction and rupture of the uterus, 2; chronic nephritis, 2; pyelo-nephritis, 2. Eclampsia, asthma, thyrotoxicosis, anaemia of pregnancy, appendicitis, and inanition were each responsible for the death of one patient, i.e. 6 in all.

1. *Obstetric Shock and Post-partum Haemorrhage.* (*Twelve cases.*)

In 2 cases pregnancy and the first and second stages of labour were normal, but post-partum haemorrhage occurred.

In 1 case pregnancy was normal, delivery was effected with the forceps, and post-partum haemorrhage occurred.

In 1 case the patient was suffering from pre-eclamptic toxaemia, and delivery was effected by the forceps. There was not any post-partum haemorrhage, but profound shock set in.

In 1 case pregnancy and labour were normal, there was not any post-partum haemorrhage, but the patient unaccountably fell into a condition of profound shock.

In 2 cases pregnancy was complicated by pre-eclamptic toxaemia, labour was normal, but the placenta was adherent, and post-partum haemorrhage caused obstetric shock. One of these patients refused admission for domestic reasons.

In 2 cases advanced phthisis was a complication. Although labour was spontaneous and easy, manual removal of the placenta was required, and the patients died from the resulting shock.

One patient was suffering from a severe degree of anaemia. She refused admission to hospital. While labour was normal till the third stage, the patient died from shock following manual removal of the adherent placenta.

One patient was admitted with intra-partum accidental haemorrhage. There was not any evidence of toxaemia during pregnancy. She died from shock shortly after delivery with the forceps and manual removal of the placenta. Central placenta praevia was a complication in 1 case. Following the extraction of a foot, the patient was given a blood transfusion. After delivery brisk haemorrhage occurred, and in spite of a transfusion of gum-saline, the patient succumbed to the shock brought on by the post-partum haemorrhage.

2. *Puerperal Sepsis.* (*Six cases.*)

In 3 cases puerperal sepsis followed normal pregnancy and normal delivery in the hospital.

In 1 case sepsis developed after normal pregnancy, and normal labour in the patient's home.

One patient developed a subphrenic abscess following a clean Caesarean section for contracted pelvis.

In the remaining case pregnancy was complicated by pre-eclamptic toxaemia. Sepsis developed after a spontaneous normal delivery.

3. *Acute Yellow Atrophy of the Liver.*

These are discussed at a later stage.

4. *Pneumonia.* (*Three cases.*)
Each patient was admitted suffering from pneumonia.

5. *Heart Disease.* (*Three cases.*)
One patient collapsed and died immediately following Caesarean section. Pregnancy and labour were normal in the other 2 cases, but the patients suddenly collapsed within a few days after delivery and died in 48 hours.

6. *Tonic Contraction and Rupture of the Uterus.* (*Two cases.*)
The first of these 2 patients had not attended the hospital antenatal clinic for 6 weeks before she was admitted in labour with the uterus in a state of tonic contraction. Death occurred from shock following perforation of a hydrocephalic head. The other patient was found to have a ruptured uterus after a labour of only 4 hours. Hysterectomy was performed, but the patient died from shock. Each patient was pregnant for the ninth time.

7. *Chronic Nephritis.* (*Two cases.*)
Each of these patients refused the offer of admission to hospital for the termination of pregnancy, in 1 case on religious grounds, and in the other a reason was not given.

8. *Pyelonephritis.* (*Two cases.*)
These 2 patients died in spite of every treatment.

9. *Eclampsia.* (*One case.*)
This patient left hospital contrary to advice when she was under treatment for decompensation due to mitral stenosis. She did not make a further appearance till she was admitted suffering from eclampsia. She died from cardiac failure during a fit.

10. *Asthma.* (*One case.*)
This patient died during an attack of asthma on the day following her admission for treatment of this condition.

11. *Thyrotoxicosis.* (*One case.*)
This patient died from acute cardiac failure, which set in during labour, the result of thyrotoxicosis. The child was delivered with the forceps, but there was not any improvement, and she died in a few hours.

12. *Acute Anaemia of Pregnancy.* (*One case.*)
This patient left hospital contrary to advice, where she had been under treatment for severe anaemia. She returned 10 weeks later at 32 weeks maturity in a dying condition. In spite of blood transfusion she died undelivered a few hours after admission.

13. *Appendicitis and General Peritonitis.* (*One case.*)
This patient died 2 days after a spontaneous miscarriage from generalized peritonitis, the result of gangrenous appendicitis. In addition she was suffering from mitral stenosis.

14. *Debility and Inanition.* (*One case.*)

This patient was unable to accept our offer of admission for domestic reasons. She died from inanition 8 days after delivery.

The figures given above, namely the maternal mortality rates per 1000 live births, are so much higher than the corresponding rates for England and Wales, for Northern Ireland, and for many other maternity hospitals, that some explanatory remarks may not be out of place. The Royal Maternity Hospital, Belfast (formerly the Belfast Maternity Hospital) is the only maternity hospital in Northern Ireland which admits obstetric cases of every type from all over the province. There are other maternity units in Northern Ireland, but they consist of only small wards attached to, or forming part of, a general hospital. Such units are not staffed by obstetricians, and not infrequently cases are sent on to the Royal Maternity Hospital after they have been treated in these outlying hospitals. As a result, many patients are admitted to the Royal Maternity Hospital who have undergone unsuccessful treatment, and who have travelled up to 100 miles before arriving at the Royal Maternity Hospital. Such cases are, as a rule, poor obstetric risks, and on account of the paucity of obstetric hospitals throughout the province and the long journeys required to be undertaken before reaching Belfast, these cases are probably more common in the hospitals of this city than in the corresponding hospitals in the large cities of the rest of the British Isles.

Another reason which tends to swell the death-rates, as given above, is the fact that in the Royal Maternity Hospital there is a unit, the Rea Block, set aside entirely for the treatment of established and suspect sepsis in any form. Not only does this unit cater for cases developing puerperal sepsis in the hospital (and these form a very small proportion of its admissions) but it receives all forms of suspect or frank sepsis from any district in Northern Ireland. Therefore, to this Rea Block are admitted many seriously ill patients suffering from established sepsis, who have been delivered some time previously under the care of their own attendants, and for whom the hospital can only assume responsibility from the time of their admission. The mortality rate in these cases of sepsis is, as in other parts of the world, unfortunately only too high, so that the calculation of our rates for the whole hospital, which includes deaths among such cases, will always result in rates much higher than in those hospitals into which cases of suspect or established sepsis are not admitted, or when their own cases of sepsis are transferred to other hospitals.

Thus, for example, during the year 1936 there were 193 admissions of emergency or unbooked cases of sepsis to the Rea Block; of these, 11 patients died, out of a total of 21 deaths occurring in the hospital, so that in order to arrive at a corrected mortality rate for the hospital, and also a rate which may be compared with that of other hospitals, these 193 admissions and the 11 deaths among them must be subtracted from the total figures, and the corrected rate calculated on the resulting data. Calculation of our maternal mortality on these lines for 1936 would reduce the mortality rate per 100 cases for total cases from 0.94 to 0.48, and the rate per 1000 live births for total cases from 12.83 to 6.10. It is well known that figures of maternal mortality for a maternity hospital are not comparable with those of the community in which the hospital is situated. It will also be seen that the admissions to the Royal Maternity Hospital, Belfast, so long as admissions to the Rea Unit are included, do not represent the same cross-section of the community as is to be found in most other maternity hospitals. Calculation of the mortality rates for the Belfast hospitals, which includes the admissions to the Rea Unit, must always result in what appears at first sight to be extravagantly high figures. Deaths among these patients must of necessity put up the mortality rate per 1000 live births, since these women have all been delivered by their own attendants before admission, and are calculated in the mortality rates, but their deliveries are not included in the total live births for the hospital. This method of calculation diminishes the number of live births per admission, and at the same time increases the mortality rate for this denominator.

At the end of this review a section will be found dealing with deaths from causes associated with pregnancy, childbirth and the puerperal state not classed as childbirth, and it will be seen that deaths from these causes numbered 19, or 13.4 per cent of the total number of deaths for the 10 years. The deaths in this group were due to such conditions as pneumonia, tuberculosis, mediastinal tumour, and other diverse conditions, such as will only be commonly met with in a general hospital, and among whom, even in such a hospital, the death-rate would probably be as great.

Of the total number of 141 patients dying in the hospital, 2 died within an hour of admission, 7 died within 2 hours after admission, and 8 died within 4 hours of admission. All these patients had travelled many miles and were moribund on admission.

The statements given alone provide the explanation for the high mortality rates existing in the emergency and total cases as shown in the above tables.

With regard to the figures for antenatal or booked cases, the deaths among such cases are considered in detail in a subsequent section. It will be seen that 8 patients, i.e. 20 per cent of the 40 antenatal deaths, were due to pneumonia, asthma, appendicitis, inanition, and thyrotoxicosis, causes for which all the antenatal care in the world will do little to prevent or relieve. The patient whose death was due to asthma died on the day following admission on her first visit to our antenatal department. Two patients, one suffering from mitral stenosis with a marked degree of decompensation, and the other from anaemia of pregnancy, left hospital contrary to advice, and returned in a dying condition, in the first case from eclampsia, and in the other from the anaemia which had progressed rapidly in the meantime. Two patients with chronic nephritis refused treatment, but remained in hospital to die undelivered; and an unfortunate woman, who died from starvation, was unable to accept our offer of admission during her pregnancy. A sixth patient also refused admission for the treatment of severe pre-eclamptic toxaemia, and advanced phthisis was the main factor responsible for the deaths of 2 patients. It will be noted, therefore, that in 6 of these cases the patient herself was responsible for the avoidable factor. These 9 cases were admitted during the years 1931, 1932 and 1934, and are responsible for the alarming rates obtaining for antenatal cases for these years.

As an obstetric surgeon who has worked in the antenatal departments of these hospitals for the last 10 years, the writer has been struck with the extremely poor nutrition of most of the women who attend. Our antenatal patients come from the poorest social stratum of the city, and, for the most part, from that section of the population among whom large families are common and are encouraged. These are undoubted factors in the production of the high mortality rates in the hospitals under review.

Patients admitted to the hospital wards on their first visit to our antenatal department are classified as antenatal or booked cases, and deaths among them are calculated in the rates for antenatal cases. Three such patients figure in the deaths among antenatal cases, two of whom were suffering from advanced pyelo-nephritis on their first visit to the antenatal department when they were immediately admitted.

In this city, as in others, antenatal clinics exist under other

authorities. In Belfast, however, the Royal Maternity Hospital receives a subsidy from the Public Health Authority in order to command the services of the hospital antenatal department. As a result, the worst cases seen in the Public Health clinics are referred to the antenatal department of the Royal Maternity Hospital, and are admitted to the hospital wards on their first visit to the antenatal department to be classified as antenatal admissions. Deaths occurring in such cases figure in the mortality rates for antenatal cases.

The above explanations give the reasons for the high mortality rates in the antenatal cases.

Consideration of the Causes of Death in the Complete Series

Puerperal Sepsis

Puerperal sepsis was responsible for the death of 33 patients of the total of 141 during the 10 years 1927–36, i.e. 23.4 per cent. (This figure is somewhat lower than the corresponding figure of 26.4 per cent of the total number of women dying in "Pregnancy and Childbirth" in Northern Ireland[2] during the same period.) Table V, which has been prepared from the reports of the Registrar-General for Northern Ireland, shows the part puerperal sepsis plays as a cause of death in childbirth.

An analysis of the 33 fatal cases of puerperal sepsis in the hospitals shows the following interesting points:

Normal delivery	14	cases
Ante-partum haemorrhage	6	,,
Spontaneous delivery with post-partum haemorrhage	5	,,
Failure to deliver with the forceps	2	,,
Craniotomy	2	,,
Clean Caesarean section	2	,,
Pre-eclamptic toxaemia	1	,,
Undelivered—intra-partum sepsis	1	,,
Total	33	cases

Two facts stand out from the above analysis (1) that puerperal sepsis followed normal delivery in 14 cases, and (2) that haemorrhage occurred in 11 cases.

The origin of infection in cases in which sepsis develops after a normal delivery is difficult to determine. According to Colebrook[3], "all the evidence we have, therefore, indicates that the dangerous variety of haemolytic streptococcus is hardly ever

present in the genital tract at the onset of labour". The other sources are external; for example, the hands, noses and throats of attendants and members of the household, and *via* the blood-stream from a septic focus elsewhere in the mother's body. Colebrook is of the opinion that the latter is so extremely improbable as not to be worth serious consideration, and of the former states "that in a considerable number of women puerperal infection was almost certainly due to transfer of the streptococcus from one or other of these potential sources". By potential sources he means external sources.

It is noteworthy that haemorrhage occurred in 11 cases. It has been definitely shown that the loss of blood is an important factor in the development of puerperal infection; of these 11 cases, ante-partum haemorrhage occurred in 6, placenta praevia was the cause of the bleeding in 5 of these 6 cases. Three of these 5 cases had been treated in their own homes by vaginal plugging. Too much stress cannot be laid upon the ill-effects of plugging the vagina as a means of treatment of unavoidable haemorrhage. Apart from the fact that it is highly productive of shock, there is not the slightest doubt that vaginal plugging is a most dangerous procedure from the point of view of producing sepsis. In this connexion the following statements by Sir Comyns Berkeley[4] are of interest. "The commonest cause of death from placenta praevia, apart from those patients who died undelivered, is septic infection. It has been pointed out that 23.5 per cent of the patients in whom the vagina was packed died of sepsis." Again he states: "Do not make a vaginal examination unless prepared to embark at once on appropriate treatment. It is true that the treatment for haemorrhage may have to be resorted to before the patient can be removed to hospital, but such cases are few and far between. A vaginal examination may easily separate an additional area of placenta, or disturb blood-clots, with the result that the amount of bleeding may increase to a serious extent before the patient can be sent into hospital, or expert assistance can be obtained. Nevertheless, when a patient is so far in pregnancy that her bleeding suggests placenta praevia as the cause, unless her home surroundings are such that she can be treated with complete confidence, she should be at once transferred to a hospital, or first-class nursing-home, before a vaginal examination is made, not only for the reasons stated above, but also because the temptation to pack the vagina will be obviated."

Browne[5] is also strong in his denunciation of vaginal examinations and vaginal packing in ante-partum haemorrhage.

Of the 33 cases of puerperal sepsis, 1 was admitted to hospital suffering from intra-partum sepsis, 16 were delivered in hospital, and 16 were admitted to hospital suffering from puerperal sepsis, having been delivered in their own homes.

The following is an analysis of the 16 cases delivered in hospital:

Placenta praevia (3 cases treated by vaginal packing before admission)	5 cases
Normal delivery	3 ,,
Failure to deliver with the forceps before admission ...	2 ,,
Caesarean section	2 ,,
Craniotomy (in labour for 30 hours in own home before admission)	1 ,,
Induction of labour in patient's own home, and admitted suffering from gas gangrene	1 ,,
Concealed accidental haemorrhage, treated by Caesarean hysterectomy	1 ,,
Pre-eclamptic toxaemia, spontaneous normal delivery	1 ,,

The following is an analysis of the 16 cases admitted suffering from puerperal sepsis following delivery in their own homes:

Normal delivery	11 cases
Spontaneous delivery, manual removal of adherent placenta and post-partum haemorrhage	4 ,,
Spontaneous delivery, inversion of the uterus and admitted suffering from gas gangrene	1 ,,

It appears, therefore, that in the hospital confinements sepsis followed the complicated delivery more frequently than the normal delivery, while in the cases confined in their own homes, the infection followed normal delivery more frequently. It is at once admitted that many of the abnormal and complicated cases are transferred to hospital before delivery, and it is to be expected that a higher sepsis-rate obtains in hospital on account of the greater number of complicated cases treated. This point was brought out by Kinloch and others[6] who showed that in Aberdeen during the years 1918 to 1927, the mortality rate from sepsis was 1 per 1000 confinements in midwives' cases, 1.7 in doctors' cases, and 4.5 per 1000 in hospital cases.

Many factors operate in the high incidence of puerperal infection, and these can be influenced in many ways. Some of the more important are: (1) longer training for pupil midwives; (2) better payment for midwives, so that a more efficient type of nurse will be attracted to maternity service. There is little

attraction for an able and well-trained nurse in many fields of domiciliary midwifery practice so long as existing standards of remuneration continue; (3) compulsory attendance by midwives at refresher courses; (4) the provision of foodstuffs to undernourished women. It is impossible to give exact figures, but every observant worker in an antenatal clinic will agree that many of the women attending such clinics are anaemic and undernourished; (5) the more general use of gloves, and particularly masks, during the conduct of labour; (6) increased assistance from Health Authorities, (*a*) by the provision and maintenance of that which Colebrook[3] describes as a Puerperal Fever Prevention Service, and (*b*) by the provision and maintenance of special hospitals for the treatment of established sepsis, or of financial assistance for existing hospitals. In Belfast there are only two such hospitals, a ward of 20 beds attached to the Jubilee Maternity Hospital, and the Rea Unit of 14 beds in the Royal Maternity Hospital, i.e. 34 beds in all. One hundred and ninety-three patients suffering from suspected or established sepsis were admitted to the Rea Unit in 1936. Surely what is being done for venereal disease and diphtheria could also be done for puerperal sepsis? The patient suffering from gonorrhoea, or syphilis, can obtain free treatment, but what does the Local Authority do for the unfortunate woman who develops puerperal sepsis through no fault of her own? (7) The oral administration of prontosil as a prophylactic measure in all cases in which labour was complicated by haemorrhage, shock, trauma, or intra-uterine manipulation, or in cases in which infection is even suspected.

Prontosil has already been proved to be of value in established sepsis; it is probably of value in preventing the onset of sepsis. The price of this drug is not prohibitive, and it could be supplied free of charge by the Local Authority to necessitous patients, as is being done by the Public Health Departments of Wiltshire (Swindon), Hampshire (Aldershot), the City of Glasgow, the Burgh of Ayr, and the counties of Dumbarton, Lanark, Ayr, and Norfolk.

Obstetric Shock and Post-partum Haemorrhage

Twenty-three patients of the series of 141 died from obstetric shock and post-partum haemorrhage, i.e. 16.3 per cent. In some of these cases there was an additional factor present, namely phthisis, which undoubtedly helped to bring about the patient's death. Delivery was spontaneous in 12 cases, and instrumental, manipulative, or operative in 11 cases.

Two patients were admitted in a state of profound shock, after unsuccessful attempts at deilvery with the forceps had been made in their own homes. One of these patients died immediately after delivery with the forceps in hospital, and the other died undelivered 2 hours after admission.

One patient was admitted after labour had been in progress 104 hours. She was grossly infected, and her pelvis was of the generally contracted type. Craniotomy was performed, and it was necessary to remove the placenta manually. Considerable post-partum haemorrhage occurred, but in spite of transfusions of gum-saline and glucose-saline, the patient did not survive the shock.

Three patients were admitted with the placenta in the uterus after delivery in their own homes. All three were moribund and died within an hour after admission. Gum-saline transfusions were given in each case, and in none would the patient's condition have stood the shock of removal of the placenta. It is probable that these cases would have been saved by treatment in their own homes by an emergency, or flying-squad service, such as is available in Newcastle-on-Tyne.

There were 3 cases of death from shock following delivery of twins. In 1 case, induction of premature labour had been performed for pre-eclamptic toxaemia. Post-partum haemorrhage followed manual removal of the placentae which were adherent.

In the second case, the first child was delivered by the forceps, and the second extracted as a breech. The placentae were delivered normally, but the uterus failed to retract, and the resulting haemorrhage brought about a state of profound shock. The third patient was delivered normally after a labour lasting 56 hours. There was no haemorrhage during or after the third stage, but shock set in within an hour, from which the patient died, in spite of transfusions of gum-saline.

Three patients were suffering from phthisis. In each case delivery was spontaneous, but haemorrhage followed manual removal of the placentae, giving rise to shock from which all 3 patients died. In each case the general condition of the patient was extremely poor. It is well known that patients suffering from pulmonary tuberculosis stand the loss of blood very badly.

There were 3 cases in which spontaneous delivery was followed by manual removal of the placenta and post-partum haemorrhage, which gave rise to profound shock.

Two patients were suffering from anaemia of pregnancy; the placenta required to be removed manually following spon-

taneous delivery in each case. Each patient was given a blood transfusion, but in spite of this the shock overcame the patient.

There were 2 cases, in which the third stage was normal, post-partum haemorrhage did not occur, but immediately following delivery the patients fell into a state of profound shock from which they did not recover. In 1 case pregnancy and labour were apparently normal; in the other case pre-eclamptic toxaemia was a complication and delivery was effected with the forceps.

One patient was admitted in labour with an oblique lie. Internal version was immediately performed. Following this the patient's condition was satisfactory, and, indeed, remained so till after delivery, when brisk post-partum haemorrhage occurred. The placenta was delivered normally, but shock supervened from which the patient died.

One patient, who had suffered from pre-eclamptic toxaemia, had an easy spontaneous delivery, but manual removal of the placenta was required. Following this, haemorrhage occurred, and the resulting shock overcame the patient. This is the third case in which pre-eclamptic toxaemia was a complication of pregnancy; it may be that the hepatic damage from this condition, plus the restriction of food necessary for treatment, were not unimportant factors in the production of shock.

There was 1 case of accidental haemorrhage, the patient being delivered by the forceps. Following delivery, further haemorrhage occurred. The patient was given a blood transfusion at once, but in spite of this shock set in and the patient died.

There was 1 case of central placenta praevia. A foot was extracted on admission when the patient's condition was not good, but bleeding was so considerable that it was necessary to control it at once. Immediately after extraction of the foot a blood transfusion was given, and the patient rallied. Following delivery, however, haemorrhage occurred, and the resulting shock brought about the patient's death within an hour.

The pre-disposing and exciting factors in the production of shock are (1) haemorrhage, (2) fatigue, (3) starvation, (4) anaesthesia, (5) toxaemia, (6) trauma, (7) exposure, and (8) poor general condition from any cause.

There is little doubt that obstetric shock might be prevented in many cases by adequate antenatal supervision, which would tend to eliminate such factors as toxaemia, antepartum haemorrhage, poor nutrition, fatigue, and trauma. Prolonged labour, especially a prolonged first stage, is a very difficult condition to improve, but there are certain factors which influence the dura-

tion of labour over which some control can be exercised. One of these is the prevention of primary uterine inertia. Many primigravidae are obsessed with terror at the thought of labour, and, as a result, they come into labour in a state of profound apprehension. This, in turn, has an adverse effect upon the strength and frequency of the uterine contractions and a condition of uterine inertia arises, which can be aptly described as apprehension inertia. Many factors operate in the production of this terror. One of these is the sadistic tendency of many women, some of whom have never borne children, to take a vicious delight in relating to the young primigravidae the pain, hardship, discomforts and risks of childbirth, and much obstetric misinformation. Another, and possibly more important factor is the amount of discussion in the public press on maternal mortality. It is not unlikely that these discussions play a considerable part in the production of the high figures. If articles dealing with childbirth must be published, more good would result if such articles pointed out that childbirth is a natural process, that in the majority of cases it is carried out normally to a successful conclusion, and that it is only in a small proportion of cases in which any departure from the normal occurs. Another factor operating in much the same way is the insistent clamour for shorter and less painful labour not infrequently by women who are unlikely to be personally affected. Every obstetrician realizes the value of analgesics and anaesthetics in labour, particularly in cases of uterine inertia, but it must be remembered that such drugs may often prove to be a two-edged weapon, and their use or abuse turn a normal case into an abnormal one almost, if not quite, to the stage of catastrophe. It is a matter for regret that maternal mortality and shorter and less painful labour have become topics of high social interest.

Apprehension inertia is a distressing condition to all concerned. The uterine contractions are weak, irregular, and very painful, and, as a result, labour is prolonged, delivery by the forceps is frequently required, and the inertia continuing into the third stage, post-partum haemorrhage is almost inevitable. By this time the patient has reached the dangerous stage of obstetric shock, and, if she survives this disaster, almost every factor necessary for the onset of infection is present. There is little doubt that this sequence, inertia, delivery by the forceps, haemorrhage, shock, or sepsis, is responsible for many maternal deaths.

While anaesthesia in labour is a valuable agent in the pre-

vention of shock it may in many cases tend to produce it. Prolonged anaesthesia of any type will lead to shock; in all the cases described above the anaesthetic used was chloroform. For many years chloroform has been used in midwifery with a reasonable degree of safety, but, apart from haemorrhage, no single factor is more calculated to produce or increase shock than its administration for an operation such as removal of an adherent placenta. Nitrous oxide is not yet practicable in all forms of domiciliary practice, but even ether with all its disadvantages is a much safer anaesthetic than chloroform when required for the operative treatment of post-partum haemorrhage. More women have lost their lives from shock, in the production of which chloroform played no small part, than from ether explosions or chest complications.

Of the 23 patients who died from obstetric shock, post-partum haemorrhage occurred in 19. Inertia is responsible for many cases of haemorrhage, but impatience during the third stage, and repeated attempts to express a placenta not yet separated, are just as important as the actual haemorrhage in the production of shock. In this connexion there is no doubt that it is unwise to transport the patient with an adherent or retained placenta. She is already in a state of shock, but the journey from her warm bed in a cold ambulance is only too frequently the straw which breaks the camel's back. Such cases should be treated in their own homes, but as matters are at the moment, this cannot be carried out in many cases, and until an emergency service is set up in this country, similar to that which the Minister of Health proposes to establish in Great Britain, there will still be many deaths from obstetric shock. In an excellent paper on obstetric shock Phillips[7] lays great stress on blood-pressure readings; a fall in pressure is the earliest sign of shock, and according to him, if more frequent readings were taken and measures adopted to treat shock at the first sign of falling pressure, fewer women would die from this condition. One of the most important of such measures is the administration of morphia, and if this were done in every case before operative treatment of post-aprtum haemorrhage was undertaken, obstetric shock would be greatly minimized. Once shock sets in, the immediate reaction is the mobilization of glycogen to furnish the body tissues with energy. It will be found that the intravenous administration of glucose in 50 per cent strength will frequently tide the patient over the crisis if given immediately signs of incipient shock appear, and this is before any extra fluid need

be given to maintain the circulating volume of blood. For established shock extra fluid must be given, and this is undoubtedly best provided by blood transfusion. There are no two opinions on the value of blood transfusion in the treatment of established obstetric shock, but a blood transfusion requires time. One intravenous injection of 50 c.c. of 50 per cent glucose to prevent shock is better than any number of post-mortem blood transfusions. John Clarke & Co. Ltd., of Belfast, have made for me a 50 c.c. syringe which is contained, already sterilized, in a spirit-proof case, and which can be carried conveniently in the average midwifery bag. Within one minute the intravenous administration of 50 per cent glucose can be commenced. An obstetric armamentarium cannot be considered to be complete without some apparatus for intravenous transfusion.

Eclampsia.

Eclampsia was responsible for the death of 15 patients of the total of 141, i.e. 10.7 per cent.

During the period under review 91 cases of eclampsia were admitted to the hospital; of these 15 died, a mortality rate of 16.4 per cent. The average mortality rate in these islands is 22 per cent. Stroganoff and Davidovitch[8] have published figures of 3 per cent, but it is doubtful if the type of eclampsia seen in the United States of Soviet Russia is as grave as that which is seen here. Two British writers, Gerrard and Newton,[9] give a death-rate of 7 per cent in the last 100 cases, which they have treated on their own lines. The only figures comparable with those of our hospitals are given by Baird[10]; the death-rate in the Glasgow Royal Maternity and Women's Hospital being 18 per cent and 17.6 per cent for two series of cases over a period of 10 years.

Not one of these patients in the Belfast series had received adequate antenatal supervision.

The records of these 15 cases show that (1) 14 of the 15 patients were pregnant for the first time and the remaining patient for the fifth time. (2) In 7 cases the eclamptic convulsions were ante-partum, in 7 cases they were both ante-partum and intra-partum, and in 1 case intra-partum. (3) Six patients died undelivered. (4) Delivery was spontaneous in 5 cases, and instrumental or assisted in 4 cases, the average duration of labour being 20 hours. (5) Maturity was between 36 and 40 weeks in 9 cases, 32 to 36 weeks in 4 cases, and under 32 weeks in 2 cases. (6) The interval between the time of admission and death was very

short, the average duration being 25 hours, with the exception of 2 patients who sustained intracranial haemorrhage during fits, and from which they never recovered consciousness. One of these patients lived for 3 days, the other for 7 days after admission. (7) Three patients were under 20 years of age, 3 were between the ages of 20 and 25 years, 5 were between 25 and 30 years, 3 were between 35 and 40 years of age, and 1 was over 40. Thus 11 patients died from what should be an entirely preventable condition under the age of 30—an appalling fact.

Eclampsia is almost a preventable condition. The one factor which keeps it from being entirely preventable when the antenatal supervision is adequate is failure of co-operation on the part of the patient. Eclampsia seldom, if ever, appears as a bolt from the blue and is almost invariably preceded by the signs and symptoms of pre-eclamptic toxaemia, so that if this condition were diagnosed and treated efficiently eclampsia would be an almost unknown disease. The following paragraph taken from the Scottish Report on Maternal Mortality[11] accurately sums up the situation:

> In all pregnant women, especially primigravidae, the blood-pressure should be tested and charted at each visit, so that a commencing rise will be clearly indicated. If the blood-pressure does begin to rise, the patient ought to be seen at weekly intervals and, if possible, kept in bed either at home or in hospital. We are fully aware of the difficulties this would cause in a working-class home, even when the majority of the women likely to be affected are primigravidae. Such intensive antenatal supervision is perhaps a counsel of perfection, but if followed it would not only lower the mortality rate from this cause, but also eliminate many cases now classed as fulminating.

We have long been taught in this school that a rise of systolic pressure to about 130 is a sign of pre-eclamptic toxaemia.

Heart Disease.

During the period under review 15 patients died from some form of heart disease, i.e. 10.7 per cent of the total number of deaths. Of these patients 5 were pregnant for the first time, 3 for the second, 1 for the third, 2 for the sixth, and 1 each for the seventh, ninth, tenth and twelfth times.

With the exception of 2 patients who were 32 weeks pregnant, maturity had advanced to at least 36 weeks in these cases. The lesions were as follows: mitral stenosis, 10 cases; aortic regurgitation and mitral stenosis, 2 cases; endocarditis (acute),

2 cases; and myocarditis, 1 case. Labour was normal in 8 cases, Caesarean section was performed in 4 cases, induction of premature labour was carried out in 2 cases, and 1 patient died undelivered.

Pregnancy complicated by heart disease presents one of the most difficult problems in obstetrics. Since 1929, 216 cases of heart disease in pregnancy were admitted to the hospitals; pregnancy was terminated in 17 cases, i.e. 7.8 per cent, and in 38 cases, or 17.5 per cent, Caesarean section was performed. Thus in 55 patients, or 25.3 per cent, the cardiac condition was so grave that pregnancy and labour could not be permitted to continue their normal course. During the 10 years under review Caesarean section was performed on 305 occasions, and in 44 cases, 14.4 per cent, the indication for the operation was heart disease.

To anyone interested in this subject two requirements stand out above all others; (1) the need for rest for patients in whom pregnancy is complicated by heart disease, in other words antenatal supervision, and (2) if the mortality from this complication is to be reduced then contraceptive measures must be adopted.

With regard to the first point, rest is the most essential and all-important feature in treatment, but how can the mother of several small children obtain this necessity, which is literally the breath of life to her? In our antenatal department we often offer admission to cases such as these; only too frequently the answer is "I can't come in for there's nobody to mind the children."

Of these 15, it is probable that 6 would have recovered if they had been seen by a doctor at an earlier stage, when it is almost certain that the pregnancies would have been terminated.

With regard to contraception, this is not the occasion for consideration of the ethical, religious, or psychological aspects of the subject, but there is not the slightest doubt that there is a very definite place for contraception if the victims of heart disease complicated by pregnancy are to be reduced in number. Of the last 216 cases which we have treated, pregnancy was terminated in 17, or 7.8 per cent, and in 45, or 20.8 per cent, sterilization was performed, i.e. in 62 cases, or 28.6 per cent, we considered that the existing pregnancy or future pregnancy would have caused the death of the patients.

The reports of the Registrar-General[2] show that during the years 1927–1936 in Northern Ireland 90 women died from heart disease complicating pregnancy, i.e. 5.2 per cent of the total number of 1,719 deaths occurring in pregnancy and childbirth.

In the Belfast and Royal Maternity Hospitals during the same period this rate was 10.7 per cent; this apparent doubling of the mortality rate is explained by the fact that the worst cases gravitate to hospital. So long as the woman with severe cardiac disease is allowed to become pregnant, so long will there be a mortality rate of at least 5 per cent from this cause alone. The death-rate among women suffering from heart disease complicating pregnancy is variously given by different writers; for example, 1.37 per cent,[12] 6.3 per cent,[13] and 4.3 per cent.[14]

There is no point in closing our eyes to contraception; it is widely practised to-day. When one is satisfied that a further and dangerous deterioration in health will result from a future pregnancy, it seems logical that advice and instruction on the prevention of pregnancy are just as much part of one's duty to the patient as attending her with all skill in labour. The authors of the Scottish Report on Maternal Mortality[11] offer the following comment:

> In some cases the condition of the woman at the beginning of the pregnancy was such that an unfavourable outcome was almost certain, and in many of these the woman had been warned at the immediately previous confinement of the danger likely to result from a further pregnancy. Many of these women had young children depending on them. Where women in such condition desire practical instruction in contraceptive measures, they should have access to expert instruction.

On the same subject the Report[15] of the White House Conference on Maternal Morbidity and Mortality reads as follows:

> It seems necessary, therefore, that steps should be taken to legalize in a more satisfactory manner the dissemination of contraceptive information, and to establish under ethical medical auspices the necessary clinics for this purpose, preferably in hospitals.

One cannot help thinking that in a more enlightened sociological order than we recognize to-day many women suffering from heart disease would never be allowed to become pregnant.

Acute Yellow Atrophy of the Liver.

This condition was responsible for the death of 6 patients, i.e. 4.3 per cent. The records of these patients show that:

(1) Prolonged labour occurred in each case, the average duration of labour being 82 hours.

(2) Delivery in every case was instrumental or assisted.

(3) Chloroform was the anaesthetic in each case, and to 2

patients was administered on two occasions. The latter 2 cases were admitted after a failure to deliver with the forceps.

(4) All the patients were pregnant for the first time.

(5) Two patients were suffering from pre-eclamptic toxaemia.

(6) Death occurred within a relatively short time after delivery, the average period being 82 hours.

Our knowledge of the cause of acute yellow atrophy of the liver is incomplete. It is known, however, that during pregnancy the liver suffers from the imperfectly understood metabolism or toxins of pregnancy. Add to these the effects of a long labour and chloroform to assist delivery, and only too frequently the result is the clinical entity known as acute yellow atrophy of the liver. The repeated administration of chloroform is much more dangerous from the point of view of hepatic damage than a single prolonged administration, and it is possible had gas and oxygen been used in some of these cases a fatal issue might have been averted.

Anaemia of Pregnancy.

Five patients died from anaemia of pregnancy, i.e. 3.6 per cent. Four patients were under 30 years of age. One patient was aged 36 years, and was pregnant for the tenth time. She had been in hospital for treatment of the anaemia, but had left contrary to advice, to return in a dying condition when labour had began. Two patients were primigravidae and 2 were pregnant for the third time. In every case the disease had reached an advanced stage before the patient was admitted to hospital, and in one case pregnancy had to be interrupted at 20 weeks maturity. With the exception of the patient who had left hospital every patient was given a blood transfusion. One patient received 6 transfusions and another was given 5, but in each case the condition was so far advanced that these were only of temporary benefit. In not one case had the patient been under antenatal supervision.

There is every reason to believe that anaemia of pregnancy in most cases is the result of deficiency of iron and vitamins in the diet. The condition is almost entirely confined to the poorer classes. The average woman of this class lives on a hopelessly inadequate diet; too frequently is the main meal, and in some cases every meal, composed of tea and white bread. It follows, therefore, that this condition could be prevented by (*a*) measures

to relieve malnutrition, (*b*) the administration of small doses of iron throughout pregnancy.

Antenatal supervision can play its important part by seeing that iron is given to the expectant mother, but malnutrition is, in most cases, one of the results of the economic chaos of the world to-day. We are told that trade is booming, if so, then we may hope that malnutrition will be relieved. It is a remarkable thought that maternal mortality may be thus reduced by the alarms and excursions of war.

Pyelo-nephritis and Pyonephrosis.

Pyelo-nephritis was responsible for the death of 4 patients. The first patient had been in hospital for some time for treatment. Her condition improved at first, but suddenly became much worse a few days before term. Labour began at the same time, and delivery was effected by the forceps. The patient's condition deteriorated rapidly, and she died 4 days after delivery. Post-mortem examination revealed an advanced degree of destruction of renal tissue.

The second patient was admitted to hospital at term with severe pyelitis. Spontaneous normal delivery occurred within a few days, but within 48 hours the patient was suffering from a bacillus coli septicaemia, from which she died 7 days later.

The third patient also developed a bacillus coli septicaemia shortly after a prolonged labour following induction for pyelitis. Death occurred 10 days after delivery, and autopsy revealed extensive destruction of renal substance.

The fourth patient was only 20 weeks pregnant, but renal damage was so far advanced that death occurred shortly after admission. An extensive degree of pyelo-nephritis was found at necropsy.

There was 1 case of pyonephrosis. The abscess was drained immediately on admission. Although pregnancy had only reached 30 weeks maturity, labour began at once, and delivery occurred easily within a few hours. The patient then became unconscious, and died from uraemia 36 hours after admission.

In all, therefore, 5 patients died from infection of the urinary tract. Four were primigravidae and 1 was pregnant for the third time. Three patients were under 24 years of age, a fourth was 28 years, and the remaining patient was aged 30 years.

The degree of maturity had reached term in 2 cases, 37 weeks in 1 case, 30 weeks in a fourth, and 20 weeks in the remaining case.

It is well known that infection of the urinary tract is commoner in primigravidae. It usually sets in at an early stage of pregnancy, and not infrequently, particularly at the outset, sets in without symptoms. A trace of albumin in the urine, however, without a corresponding rise in blood-pressure should always excite the suspicion of infection of the urinary tract.

This condition is one of the most serious risks to which the pregnant woman is exposed, for in nearly every case toxaemia becomes evident to a marked degree. Textbooks lay little stress on this subject; there is not any doubt that it is a very grave condition, and in this small series of cases was responsible for a mortality rate of 3.6 per cent.

Chronic Nephritis.

Four patients died from chronic nephritis. Two had attended our antenatal department, but each had refused repeated offers of admission to terminate the pregnancy. The first of these had a blood-pressure reading of almost 300 mm. Hg., and died undelivered at 36 weeks maturity. She was pregnant for the seventh time and was aged 42 years. The other patient had a blood-pressure of 200, although her age was 35 years, and she was only 20 weeks pregnant. She was pregnant for the first time and did not give any reasons for her refusal to have the pregnancy interrupted. She died from cardiac failure. The remaining 2 patients were emergency cases. Induction of miscarriage was successfully performed for the first of these shortly after admission at 24 weeks maturity. Death occurred in a few days from uraemia. The other patient died from uraemia at the age of 42 years, a few days after a spontaneous delivery at 36 weeks.

Chronic nephritis may result from such conditions as scarlet fever and other acute streptococcal infections, but there is much evidence to suggest that it not infrequently follows pre-eclamptic toxaemia during a previous pregnancy. That being so, it is to some extent a preventable condition, and to avoid its subsequent development it is advisable to terminate pregnancy if complicated by pre-eclamptic toxaemia, as soon as it is seen that the toxaemia is not reacting to adequate treatment.

Termination of pregnancy should always be performed in cases of established chronic nephritis as soon as pregnancy is diagnosed. If pregnancy is allowed to continue, the patient in many cases will die of uraemia, cerebral oedema, intracranial

haemorrhage, or cardiac failure. If she escapes these risks she is fortunate if pregnancy terminates prematurely at an early stage; if not, the foetus is born dead, and the patient's expectation of life is materially reduced by further irreparable damage to her kidneys. Chronic nephritis is such a serious condition that sterilization should always be performed, during the operation of termination of the pregnancy or shortly afterwards, before the patient can again become pregnant. The remarks made earlier on contraception and heart disease are equally applicable to chronic nephritis.

Hyperemesis Gravidarum.

Four patients died from hyperemesis gravidarum, i.e. 2.8 per cent.

The first patient was a primigravida, and was admitted to hospital in labour at term in a moribund condition. She was delivered at once, but died 12 hours later. This patient had been vomiting almost continuously for 2 weeks prior to admission.

The second patient was 12 weeks pregnant for the first time. She had been vomiting for 8 weeks, and on admission was in an advanced state of dehydration and emaciation. Under gas and oxygen anaesthesia, pregnancy was terminated by curettage within 24 hours, but the patient became steadily worse and died 8 days later.

The third patient was also a primigravida, and pregnancy had reached 30 weeks maturity. She was admitted to hospital in labour with a history of vomiting for some weeks. Delivery took place forthwith, but the patient's condition was so poor that she died almost at once.

The fourth patient was pregnant for the second time and was 16 weeks mature. She had been vomiting for several weeks and her general condition was extremely poor. Pregnancy was terminated by vaginal hysterotomy 48 hours after admission, but the patient died 2 days later.

Hyperemesis gravidarum may be either a manifestation of toxaemia, or neurotic in origin. It is not uncommon, however, for the neurotic form to reach the stage of toxaemia if inadequately treated.

In either case treatment is likely to be unsuccessful unless carried out in an institution. The 4 cases described above were certainly toxaemic by the time of their admission to hospital. Such cases tax to the utmost the resources of the family doctor, the obstetrician, and the biochemist, even with all the aids of a

well-equipped and efficiently staffed hospital, and treatment is not infrequently unsuccessful till pregnancy has been terminated.

Pre-eclamptic Toxaemia.

There were 4 deaths in this series from pre-eclamptic toxaemia, a rate of 2.8 per cent.

The first patient was admitted on the verge of eclampsia, and died undelivered 48 hours later from acute oedema of the lungs.

The second was admitted in labour with a severe degree of toxaemia. Delivery took place normally within a few hours, but the patient sustained an intracranial haemorrhage almost immediately from which she died in 4 hours.

The third patient was also admitted with imminent eclampsia, and was delivered within a few hours. She recovered slightly for 24 hours, but then suffered an intracranial haemorrhage and died almost at once.

The fourt hpatient was admitted with a blood-pressure of 200 mm. Hg. Although delivery occurred at once, coma supervened from the intense toxaemia, and the patient died within a few hours.

The first and second patients were pregnant for the first time, the third for the sixth time, and the fourth for the eighth time.

Not one of the patients had sought medical advice. Pre-eclamptic toxaemia is a condition which should never reach a dangerous stage under antenatal care, and there is no doubt that if these patients had received adequate treatment their lives would have been saved.

Accidental Haemorrhage.

There were 3 cases in which death was due to accidental haemorrhage. The first was at term, the patient aged 36 years and pregnant for the eleventh time. She had not attended a doctor or antenatal clinic. On admission she was moribund due to concealed accidental haemorrhage, and died undelivered within 2 hours.

The second case was also one of concealed accidental haemorrhage. The patient had not sought antenatal supervision. Caesarean hysterectomy was performed immediately on admission, but the patient never recovered from the initial shock and toxaemia and died within 2 hours.

The third patient was admitted in labour in a state of profound shock, due to intra-partum accidental haemorrhage of the

mixed type. She had not received antenatal supervision, and although she delivered herself a few minutes after admission, she never recovered from the toxaemia and shock, and died within 2 hours.

Accidental haemorrhage is almost always a manifestation of pregnancy toxaemia, and in most cases is associated with albuminuria. Albuminuria was present in each of the above cases. There is little doubt that had these patients sought antenatal advice, the toxaemia would have been diagnosed, and the condition ultimately responsible for their death prevented.

Tonic Contraction and Rupture of the Uterus.

These conditions were responsible for the death of three patients, i.e. 2.1 per cent.

Two patients were admitted with rupture of the uterus. The first was a primigravida and had been delivered of a hydrocephalic foetus in her own home. Subtotal hysterectomy was performed on admission, but she died from peritonitis 13 days later. The other patient was pregnant for the ninth time, her previous 8 confinements being normal. After a labour of 4 hours the uterus was found to be ruptured. The patient was admitted to hospital without delay, where subtotal hysterectomy was performed, but she died shortly after operation. The third patient was pregnant also for the ninth time. She had attended the antenatal clinic of the hospital 6 weeks before she returned in labour with the uterus in a state of tonic contraction. The foetus was a hydrocephalic monster, and was delivered without delay. The patient died in 3 hours.

In the 2 cases in which the foetus was a hydrocephalic monster it is reasonable to assume that had antenatal supervision been adequate the patients might have been saved. X-ray examination would have shown the abnormal condition, and steps taken to prevent the ultimate disaster. Two patients were examples of the "dangerous multipara". It is not unnatural for a patient who has had several normal confinements to think that further labours will be equally uneventful, but as frequency of pregnancy rises so does maternal risk increase from antepartum haemorrhage or rupture of the uterus.

Cortical Necrosis.

One patient died from this condition. She was admitted to hospital with complete suppression of urine after labour had

been in progress in her own home for 48 hours. In spite of every known means to stimulate renal function, the kidneys failed to respond and the patient died undelivered 60 hours after admission.

The aetiology of this condition is obscure, but it appears to be associated with previous or existing pregnancy toxaemia or disease of the kidney. There does not seem to be any means of preventing the condition.

In 1936 Gibberd,[16] reporting 2 cases of his own in which recovery had taken place, could find only 1 case of recovery from cortical necrosis reported in the literature where the condition had been proved histologically.

Pulmonary Embolism.

One patient died from this condition 17 days after classical Caesarean section, performed for contracted pelvis. Very little can be done to prevent this catastrophe, and until our knowledge on the aetiology and prevention of the condition increases it will remain one of the dangers of surgery.

Deaths from Causes Associated with Pregnancy.

The remaining 19 patients died from general medical or surgical conditions associated with pregnancy, which can hardly be classed as obstetrical. The cause of death in these patients was as follows:

Pneumonia	6 cases
Tuberculosis	5 ,,
General peritonitis, other than puerperal sepsis	3 ,,
Asthma	2 ,,
Thyrotoxicosis	1 ,,
Mediastinal tumour	1 ,,
Debility and inanition	1 ,,

In the group in which pneumonia was the cause of death the disease was of the lobar type in 5 cases, and of the broncho-pneumonic type in the remaining case. In all cases the condition was present on admission to hospital. Three patients were between 20 and 24 weeks maturity, and each died undelivered. The other 3 patients were at term and were delivered normally, one in her own home and one in hospital. The other patient was admitted in labour suffering from broncho-pneumonia, probably post-influenzal, and delivery was effected by the forceps shortly after admission. Five patients died from some form of tuberculosis;

3 were suffering from the acute pulmonary type of the disease, and death occurred in each case within 10 days after admission. One case was admitted with a missed abortion, complicated by acute miliary tuberculosis, an invariably fatal disease. The condition of the patient was so grave that operative interference to empty the uterus was not undertaken. The remaining case was admitted 4 weeks after a normal delivery in her own home suffering from tuberculous peritonitis.

There were 3 cases of death from general peritonitis. The first was admitted in a dying condition; and post-mortem examination did not reveal any cause for the peritonitis. In the other 2 cases acute gangrenous appendicitis was the primary cause. Pregnancy had not reached mid-term in any of these cases.

There were 2 deaths from asthma; one patient died before, and the other shortly after, delivery. In each case death occurred during an attack. The patient suffering from thyrotoxicosis was gravely ill. Acute cardiac failure appeared during labour, and although delivery was effected by the forceps as soon as possible, her condition did not improve, and death occurred a few hours later. One patient was admitted in a state of advanced cachexia, due to a mediastinal tumour. Pregnancy had reached 24 weeks maturity, and the patient died undelivered 14 days after admission. Although a post-mortem examination was not carried out, the clinical evidence was sufficient to diagnose the malignant nature of the growth. The patient whose death was due to inanition was in poor circumstances. Admission to hospital had been offered her, but for domestic reasons she was unable to accept. Although labour was easy, her condition was so advanced that she died 8 days after delivery.

The Primary Avoidable Factor.

Adopting the standards laid down by the Departmental Committee on Maternal Mortality and Morbidity in the Interim[17] and Final[18] Reports, these 141 cases fell into the following groups:

Group 1.	Cases showing a primary avoidable factor ...	91
Group 2.	Cases in which no departure from established practice having a causal relation to the death has been found	49
Group 3.	Cases not relevant to this part of the investigation (viz. abortion and extra-uterine gestation)	1
Group 4.	Cases in which the information was insufficient ...	0
	Total	141

Thus in 91 cases, or 64.5 per cent of the total, the information indicates a primary avoidable cause.

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Analysis of 496 Private Obstetric Cases

BY

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THIS paper has been elaborated from the evidence submitted to the Maternity Services Committee set up by the Government of Northern Ireland 1937, and is a review of 496 consecutive cases attended throughout pregnancy, labour, and the puerperium by myself. The object in presenting this evidence was twofold:

(1) To prove the value of the continuity of attention by an individual attendant.

(2) To show the results possible when adequate advice and care were proffered and accepted and when lack of nutrition was not a factor, in contradistinction to the series of cases reviewed by Mr. H. I. McClure, F.R.C.S., for the same Committee.

While the statistics presented compare favourably with the general statistics of the country, they are not put forward as an ideal, since equally good results could be produced by many individual practitioners.

The series shows a rather higher incidence of obstetrical complications than the average, but apart from that is representative of the type of case met with in practice. All types of obstetrical abnormality have been encountered in this series, e.g., cardiac disease complicating pregnancy, tumours complicating pregnancy, placenta praevia, accidental haemorrhage, pyelitis, breech presentation, contracted pelvis, and malpresentations.

The series also shows a higher percentage of primigravidae

than the general average. There were 280 primigravidae and 216 multigravidae, or 56.45 per cent, first confinements. In addition 25 of the multiparae had been referred on account of previous difficult labours or stillbirths.

Maternal Mortality.

Of the 496 patients who attended, 1 died. This represents a maternal mortality rate of 2.03 per 1,000 live births or 0.2 per cent of the cases treated as compared with the figure of 7.3 per 1,000 live births for Northern Ireland in 1936.

The sequence of events leading up to this patient's death is very instructive. From the time she became pregnant she was obsessed with the idea that she was going to die and, in preparation for this event, she disposed of her property as she desired. She suffered from severe vomiting during the early weeks of pregnancy, and in the last few weeks developed a severe degree of albuminuria. On account of this labour was induced under chloroform-and-ether anaesthesia, but the patient removed the induction tube a few hours later. This was re-introduced and labour, when it commenced, was prolonged. Delivery was effected with the forceps after 48 hours, under anaesthesia, but the patient never recovered consciousness, dying three days after delivery. During this time her temperature rose steadily and she became progressively more jaundiced. A post-mortem examination was not made, but the condition was probably an acute hepatic degeneration following the three anaesthetics.

The sequence of fear, albuminuria, prolonged labour, and anaesthesia is a feature of many cases dying in childbirth. This fact is notably illustrated in Mr. McClure's paper in which he shows that acute hepatic damage, in his series of 141 maternal deaths, was responsible for the death of 6 patients, or 4.3 per cent.

Foetal Mortality.

The 496 mothers gave birth to 506 infants, i.e., there were 10 cases of twins. Of these 506 babies 13 were stillborn, or 2.6 per cent (26 per 1,000) as compared with the general rate of 41 per 1,000 (quoted by F. J. Browne) and the rate of 40 per 1,000 in the Royal Maternity Hospital, Belfast. The details of these deaths are:—

TABLE I.

Foetal Mortality.

Maceration	5
Anencephalic monsters	2
Albuminuria	1
Accidental haemorrhage	1
Entanglement of the cord	1
Version for placenta praevia ...	1
Brow presentation	1
Unexplained	1

If the five macerated foetûs and the two anencephalic monsters are eliminated the corrected foetal mortality is 1.2 per cent.

The common causes of death in childbirth are:—

1. *Puerperal sepsis.* This was responsible for 23.4 per cent of the total in McClure's series and 26.4 per cent of the total number of women dying from "diseases of pregnancy, childbirth and the puerperal state" during the 10 years 1927–1936 in Northern Ireland (Report of the Registrar-General of Northern Ireland).

2. *Shock and haemorrhage.* In McClure's series this accounted for 18.4 per cent of the deaths and 15.0 per cent of the total deaths during the 10 years 1927–1936 as recorded in the Registrar-General's reports for Northern Ireland.

3. *Pre-eclampsia and eclampsia.* This accounted for 11.5 per cent of the deaths in McClure's series and 16.8 per cent of the total deaths in Northern Ireland during the 10 years mentioned above.

For the purpose of comparison the incidence of these conditions in my personal series of 496 cases is analysed below.

PUERPERAL SEPSIS AND PUERPERAL PYREXIA.

Six patients were morbid according to the British Medical Association standard, an incidence of 1.21 per cent. If the death is included the morbidity rate is 1.41 per cent. The following table shows the causes of morbidity.

TABLE II.

Morbidity.

Cause	No. of cases
Puerperal sepsis	2
Phlegmasia alba dolens ...	1
Acute mastitis	1
Retained membrane ...	1
Cause undiscovered ...	1

In all cases in which pyrexia occurred, a uterine swab, catheter sample of urine, and the blood were examined bacteriologically. The early investigation of all cases of puerperal pyrexia cannot be too strongly stressed. So often it is found that the patient has been ill for several days before any attempt is made to discover the cause or to institute treatment. A certain number of cases of puerperal sepsis will always die, but the mortality is much lower when treatment has been commenced as soon as the rise of temperature is discovered. This is even more important since the discovery of the value of the sulphonamide group in the treatment of established streptococcal infections. It seems reasonable to administer some preparation of this drug at the onset of pyrexia even before the nature of the infecting organism is determined, since most cases are haemolytic streptococcal in origin.

Positive uterine swabs were obtained in only 2 of the 6 cases mentioned above, an incidence of puerperal infection of 0.40 per cent in 496 cases. There is little doubt that all cases of phlegmasia alba dolens are infective in origin and should be included under puerperal infection but to conform with the classification of the Registrar-General the one case has been placed under a separate heading. This case showed negative uterine swabs.

The 2 cases of puerperal sepsis are worthy of note. The first had been running a temperature for 2 years prior to delivery and had been under the care of a physician who had been giving her a vaccine for a mild streptococcal infection. During pregnancy she had an evening temperature of 99°F. Spontaneous delivery at term occurred without previous vaginal manipulations. On the evening of delivery she developed a temperature of 101°F., and although she was febrile for 3 weeks she did not give the slightest cause for anxiety. The same organism, isolated 2 years previously, was present in the uterine swabs. This case was probably one of auto-infection.

The second case of puerperal infection had a contracted pelvis and the possibility of a Caesarean section being necessary was considered.

On account of this every care was taken to prevent infection of the genital tract. Labour lasted 36 hours and was terminated with the forceps, a living child being delivered. The temperature rose to 103°F. on the third day and a non-haemolytic streptococcus was isolated from the uterus. This patient was seriously ill for 10 days but ultimately recovered.

This patient must have been infected at some stage during or after the delivery in spite of the usual antiseptic and aseptic technique.

In analysing these 6 cases it is noteworthy that no case of pyrexia or puerperal sepsis occurred in any patient delivered in her own home where the patient is attended by one nurse. All the cases occurred in nursing homes and 4 of the 6 occurred in 1 home.

The complicated obstetric case is undoubtedly safer in a hospital or nursing home as additional assistance is always available in an emergency, at the same time the greater risk of infection must be recognized especially in homes where cases other than obstetrical are admitted. I can recall being asked to see a very bad case of puerperal sepsis in a nursing home. It was later discovered that her nurse was also dressing a septic compound fracture in the adjoining room. The nursing home which devotes itself entirely to the care of the parturient woman is a great blessing to doctor and patient but, if it is to be without risk to the patient, it must be most conscientiously managed and never overcrowded.

Shock and Haemorrhage.

This complication occurred in 4 patients, in 3 of whom the condition was alarming and in the fourth was mild in degree. This is an incidence of 0.81 per cent. In McClure's series shock accounted for 16.3 per cent of the total deaths.

The low incidence of shock in my series is attributable to several factors.

(1) Careful antenatal supervision and the prevention of anaemia. There is no doubt that in addition to the value of the careful routine examination during the antenatal period the confidence established between the patient and her attendants, both nurse and doctor, is of inestimable value in the prevention of fear, inertia, and shock. This desirable feature cannot be obtained unless there is continuous supervision during the antenatal period and during labour, and it is usually absent among patients who attend clinics where the antenatal care and the labour are supervised by different individuals.

(2) Good nursing and the provision of sufficient food and fluid during the course of labour. The undoubted advantages of a good nurse do not require any elaboration, and one feels certain that the good results which may be obtained

by any obstetrician largely depend on the type of nurse with whom he works.

(3) The discriminate use of analgesics during labour and the presence of an efficient anaesthetist at the time of delivery.

Every obstetrician must be convinced of the value of analgesia in labour particularly from the point of view of the prevention of shock. I would repeat Van Hoosen's remarks with which she concludes her paper on the use of scopolamine: "Even if the delivery be brief; if it is distinctly painful, anaesthesia is advisable, because it is humane, and because it not only relieves ordinary pain, but distinctly decreases mental perturbation and nervous shock, both of which are important factors in the near and remote lifetime of the mother. Although chloroform, ether or gas given during a pain, may be adequate in many normal deliveries, the mere relief of pain is not all that is needed if the delivery is one that engenders fear on the part of the patient, for one of the blessings of scopolamine-narco-anaesthesia is the production of unconsciousness."

While I am a strong advocate of the use of some form of analgesia, and especially scopolamine, any of the analgesics must be employed with caution and judgment if they are not to defeat their purpose.

The presence of a capable anaesthetist at the delivery is a most important factor in reducing maternal mortality. Of this factor more has been mentioned in the conclusions.

(4) The proper management of the third stage of labour. The importance of this factor is so obvious that it need not be stressed further.

Of the 4 patients in whom shock occurred 2 had a manual removal of the placenta and 3 of the 4 had post-partum haemorrhage. Three of the 4 were seriously shocked but recovered as sufficient assistance and the necessary transfusion apparatus were immediately available. A delivery should not be undertaken without adequate facilities being at hand to combat shock at the earliest moment. This condition arises so quickly that there is often little or no time in which to obtain the necessary equipment if it is not already at hand.

Albuminuria.

Albuminuria, the result of pre-eclamptic toxaemia or pyelitis, occurred in 63 cases to such a degree that active treatment was necessary. The incidence of this serious complication was, therefore, 12.70 per cent.

The fact that eclampsia did not occur in spite of the severity of some of the cases is a very strong argument in support of efficient antenatal care. Albuminuria and an elevation of the blood-pressure can be detected long before the patient shows symptoms of pre-eclampsia. I teach that a patient with albuminuria should never be allowed to have symptoms, and that if symptoms appear it is evidence of the failure to adopt the proper treatment in time.

The one death in this series occurred in this group. The details of this case have been given earlier but in the light of the experience gained in the intervening years I feel sure that the repeated anaesthesia had an important influence on the fatal result.

If a general anaesthetic is necessary for induction of labour gas and oxygen should be used. Repeated anaesthesia with chloroform is particularly dangerous in any type of obstetrical case but more particularly in these toxaemic cases.

In presenting a series of cases such as this one is open to the criticism that the cases dealt with belong to a class which can afford to be properly fed and have their confinements under relatively favourable conditions. As against this criticism I would point out that they belong to the class having, as a rule, the highest maternal mortality, as shown by the Registrar-General's Report for England and Wales.

TABLE III.

Maternal mortality according to social class of husband, 1930–32.

Class	Mortality per 1,000 live births
1-2 Professional	4.44
3 Skilled	4.11
4 Semi-skilled	4.16
5 Unskilled	3.89
All	4.13

In analysing these cases I have only dealt with the three commonest causes of death in childbirth, and in conclusion I wish to summarize my ideas of the methods by which the mortality from these complications may be reduced.

PUERPERAL SEPSIS.

As mentioned above early notification and treatment is a most important factor in reducing maternal mortality. In

Northern Ireland compulsory compensation of the nurse, who is suspended as a result of attending a patient with puerperal pyrexia, is not enforced and as a result many cases are concealed until the condition of the patient becomes serious. The midwife with an obstetric conscience notifies a temperature immediately on every occasion and, unless she receives compensation, may, as a result, suffer serious financial loss. One has to admit that one rarely sees cases of puerperal sepsis when an efficient nurse has been in attendance, but this is the very nurse who would suffer most in the event of infection occurring.

A service of efficient well-paid nurses whose income would not suffer as a result of the notification of cases of puerperal sepsis would be a great advance in dealing with this problem.

Shock and Haemorrhage.

This group presents greater difficulty as these complications occur so rapidly and in many cases without warning. McClure has pointed out that rather more than 50 per cent of the deaths due to these factors occurred after spontaneous deliveries, and one suspects that these cases were the result of some mismanagement of the third stage of labour. To deal with these cases at least two doctors are always necessary, and some service should be available to deal with them in their own homes at the earliest possible moment. Removal of these patients to an institution is nearly always associated with a fatal result. Many cases will recover with intravenous medication but a certain number require a blood transfusion, the delay, however, associated with obtaining a blood transfusion in a patient's home means that the patient is dead or moribund before the blood can be given.

While being in complete sympathy with the idea of an Emergency Service such as that inaugurated in Newcastle-on-Tyne, I think that it is still not enough. If, in every case of prolonged labour or delivery with the forceps, it was in the power of the medical attendant to obtain the assistance of a colleague irrespective of the financial status of the patient then many cases of shock could be saved. The present position of obstetrics is the result of a bad tradition. A patient does not expect her family attendant to anaesthetize her and remove her acutely inflamed appendix at the same time, and yet the public have been educated to expect a more difficult and dangerous operation to be performed with a nurse giving the anaesthetic and,

with the patient half anaesthetized, the forceps is applied with little observance of an aseptic technique. Many cases of shock are in this way needlessly produced.

Pre-eclamptic Toxaemia and Eclampsia.

Efficient antenatal care can prevent the latter and diminish the after-effects of the former, but this requires the co-operation of the patient. It is sometimes very difficult, especially among the poorer classes, to convince a woman who requires treatment of the necessity for this even in the presence of symptoms. It is still more difficult when symptoms are absent. In a working-class home the mother is the mainstay upon whom the home and other children depend, and often she has to work when she should be in bed. In Holland the attitude taken is: "If the mother is sick the house is sick," and help is provided to look after house and children. This service permits the admission of the patient to hospital without giving her the additional worry of what is happening at home. In better-class homes this difficulty does not arise, as a nurse or efficient servants can be obtained.

The municipal rates are higher in Holland than in Northern Ireland, but fewer women die in childbirth and from the complications of pregnancy. In other words "safe motherhood is a purchasable commodity."

I am indebted to Mr. J. Scott, of the Department of the Registrar-General of Northern Ireland, for his suggestions and for correction of the figures accompanying this communication.

An Exact Method of Determining Ovulation and Pregnancy

BY

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IN the treatment of one of my patients for primary amenorrhoea, I have applied the organo-short-wave method and have so far succeeded in causing a menstrual flow ten times with a cycle of 28 days. During my treatment I have made the following observations:

The day before the second menstruation occurred I ascertained when making the endocrine electro-diagram that the system was perfectly balanced, but that all the figures oscillated in a remarkable manner around 180. At first I could not find any explanation for this. Eight days after the menstruation the endocrine was also balanced, but now it appeared that the figures had moved to the level of 150. I, therefore, endeavoured to discover in the case of normal women how the reduction figures taken daily of the oxyhaemoglobin test before and after menstruation stand in relation to each other.

It appeared that these figures during the cycle of a woman showed typical oscillations, by which in a simple manner and with accuracy, the increasing and the decreasing of the basal metabolism can be shown as index of the hormone-level before, during, and after the menstruation and during ovulation. The graph which I made with the use of these figures I have called a cyclogram (Figs. 2 and 3). The details of this cyclogram will be described below, as also its bearing on the question of conception and abstinence, and especially for the determination of pregnancy. The cyclogram shows how very exactly by such reduction figures the position of the hormone-level is indicated; that is, the contents of the blood in activators and regulators of the basal metabolism.

The basis of the method is as follows[1]: One of the interdigital webs, preferably that between the thumb and index finger, is clamped off by means of the fenestrated pelotte of the cycloscope: in this way a temporary interruption of the circulation is induced in this region, measuring about 6 mm. Spectroscopic examination of this section of the tissues in good illumination

shows in the yellow and green portions of the spectrum two sharply defined dark absorption-bands—those of oxyhaemoglobin (HbO_2)—between which is found a sharply defined light yellow band (Fig. 1). After a short time the dark bands become indefinite, fade away, and finally completely disappear. In the place of these bands, separated by an interval of yellow, there appears a broad, grey homogeneous band. At this point reduction of the oxyhaemoglobin has been completed. The tissue which is being examined has combined with the oxygen of the oxyhaemoglobin (tissue respiration). If conclusions of importance are in question, it is advisable to estimate the reduction-time in two or three successive observations and take the average. The small variations are due to lack of complete accuracy in the examining eye. With some little practice and experience this factor can be eliminated, and the exact time estimated to a second. It is also advisable, in the commencing stages, to conduct the examination in a darkened room or in artificial light, by which means one gets a sharper and more definite view of the processes in question.

After five to seven seconds two new bands are to be seen, lying somewhat more closely one to another, i.e. separated by a narrower yellow-green space. (The whole picture is less distinct, and in addition lies somewhat more to the left of the spectrum than the oxyhaemoglobin bands.) These are the absorption bands of methaemoglobin (HbO). The beginner will find it simpler, in the estimation of the reduction time of oxyhaemoglobin, to await the appearance of the methaemoglobin bands, and then deduct about 5 seconds from the time established as necessary for this. If the conditions are further observed it is seen that the methaemoglobin bands again disappear with a rapidity which varies in different persons (10–40 seconds). The same sequence of events is now repeated several times, and at a quicker rate (tissue respiration). It is conceivable that the measurement of the time taken by this coming and going of the methaemoglobin bands might prove to be of importance in the differential diagnosis between various diseases.

When, after the reduction-time has been measured, the constriction is released—so that the circulation is once more restored and there is a new supply of blood containing oxyhaemoglobin—there is a sudden reappearance of the above-described oxyhaemoglobin bands with the broad yellow band in between. It is advisable when making a number of successive counts not to clamp the same place each time. This can be avoided by making

a sketch of the two hands and marking on it with a small cross the sites at which the clamp has been applied.

Vierort (1876) and Henocque, and later Hoppe-Seyler,[2] Guillaume, Erich Meyer (1926), Reinhold, Lucas, Zondek, Ucko and Koch were the first to try to investigate in the case of animals and men the reduction time of oxyhaemoglobin for the differential diagnosis of various diseases. The influence of poisons, especially of anaesthetics and narcotics, on the basal metabolic rate and the blood of the animal organism was also determined by this method. (Reinhold and E. Meyer.) Subsequently Dausset in 1936 recommended this method of analysing the endocrine system. This determination becomes considerably more important by the determinations described below of the cycle curve, the ovulation-time and pregnancy.

With a simple instrument, the cycloscope (Fig. 8), the reduction time is determined. In the case of healthy, normal people, with the endocrine system balanced, this is about 150 seconds. With men and women in the climacteric, the reduction figures, taken daily, are constantly around about 145 seconds. In the case of a sexually mature woman these figures are apt to oscillate.

If the reduction figure of a woman aged 30 is ascertained every day for one month, that is in a woman in the prime of her sexual life, with a cycle duration of 28 days (Fig. 2), such a cyclogram shows three declines of which one, the decline of the menstruation, is most pronounced. The two other declines are shorter in duration and deviate slightly. With abdominal operations (Fig. 7) which were performed after having observed the ovulation decline with the aid of the cycloscope, a recently burst Graafian follicle was always seen.

Further, it has been ascertained that in a series of 20 sexually mature women, between the ages of 25 and 40, who were examined, all ovulated twice a month (cycl. 2, 3, 4). Most nulliparae, of whom the youngest examined by me was 16 and the oldest 23 years old, ovulated three times (cycl. 7). The preovular increase of the hormone-level is a complicated process which goes together with the increasing production of folliculin, gonadotropic, and other hormones, as a preparation for ovulation. The ovulation-decline of the cyclogram is the manifestation of a similar complicated process, which consists in an abrupt analysis of the Graafian follicle, the temporary interruption of the folliculin and anterior pituitary hormone formation, and the production of the luteinizing hormone. When performing an

abdominal operation on 2 patients I had the opportunity of ascertaining that on one occasion the left, and on the other the right ovary was ovulating. One of the patients, a woman 29 years old, was operated upon for retroflexion of the uterus, the other, a girl of 17 years, for chronic appendicitis. In both cases the operation was performed after the determination of the second ovulation.

In the case of the patient with retroflexion of the uterus, who appeared to ovulate twice a month, a freshly burst Graafian follicle was found in the left ovary, and in the right a fresh corpus luteum. In the case of the patient operated upon for appendicitis, who had three ovulations per cycle (Fig. 7), a freshly burst Graafian follicle was found in the right ovary, and in the left a fresh corpus luteum and a follicle in the course of development. Thus the proof was furnished that the declines shown in the cyclogram, which are mostly visible on the 9th, 10th, 11th or 12th day and on the 17th or 18th days of the cycle, depend on two and three ovulations respectively during one cycle. By this research it is further proved that the ova develop and ripen according to certain laws, and that the Graafian follicles burst independently, although between the ovulation and the menstruation there is, in most cases, a certain relation of time.

So far it has not been possible to ascertain accurately by any method when a woman ovulates. Halban and Köhler have stated that a woman ovulates between the 8th and 18th days before menstruation; von Schaw named the 13th till the 17th day, Schröder the 14th till 16th day, Ogino the 13th till the 17th, and Knaus states the 15th day before the menstruation. There has always been mention of only one ovum. By the method of examination described above, it has been proved that a woman releases at least two ova during one cycle. This was already quite obvious, since a woman has two ovaries. Also the occurrence of binovular twins, super-foetation and super-fecundation prove that more than one ovum is released during a cycle. Yet, up to now the theory has been maintained that there is only one ovum per cycle. The different results of the various investigators, and the complicated tabular calculations as given by Ogino and Knaus, have now been reduced to an exact science by the use of the cycloscope, so that one is now able to determine accurately the day on which a woman ovulates.

Q.E.D.

In the cyclogram we recognize the following phases: the menstruation decline (Fig. 2A), the first pre-ovular highest position (B), the first ovulation decline (C), the second pre-

ovular highest position (D), the second ovulation decline (E) and pre-menstrual highest position (F). The highest and the lowest figures, and also the duration of the phases vary in the case of different women, and also with the same woman, during succeeding months. Between women with a cycle of 26 to 28 days and those with a cycle of 30 to 31 days, there is a difference in the time and the course of the menstruation decline (compare the similarities and dissimilarities in the cyclograms 2 and 3). With young women, and sometimes also with older women, we often find all the figures raised. It happens, especially in the case of young girls who ovulate three times (Figs. 7 and 8), that the declines and rises of the ovulation take place in one day only and that, in between, there is hardly any intermission (see cycl. 7, 8). Only in quite exceptional cases is the time of the ovulation also protracted.

The most likely time for a woman to conceive is during the days of the declining ovulation curve. The day after the very lowest point conception is already doubtful, and one day later it is practically impossible, since we know that the ovum can be fertilized for only 2 days. The problem of conception has thereby been solved in quite a simple manner.

As for the problem of abstinence, the situation is here entirely different because the various researchers (Knaus,[3] Pryll, Nürnberger) do not agree as to the duration of the life of the spermatozoa in the female genital tract (2 to 15 days). This problem cannot be dealt with here in detail. It can, however, be stated that a woman is sterile after her last ovulation till the next menstruation. During the menstruation, and about 3 to 4 days after, a woman is most probably sterile if, according to Knaus, the spermatozoa only retain the power of fertilizing for about two days; during the remaining time there is a chance of conception. From the foregoing it follows that the time of absolute sterility is longer in the case of a woman with a cycle of 31 days than in the case of a woman with a cycle of 26 to 28 days; in the case of young girls having three ovulations this time is shorter.

Miculicz, Radecki[4] and other researchers of recent times, state that the spermatozoa travel 2 to 3 millimetres per minute. In one hour this results in a total distance of 12 to 18 centimetres (Stöckel). According to this calculation the spermatozoa can have reached the ampullary section of the Fallopian tube within 90 minutes, and there impregnate the ovum.

It is of equal if not of greater importance that pregnancy

causes a cessation of menstruation and ovulations, and that along with these the cycle oscillations of a woman also stop. Inversely it has been ascertained, by examining many pregnant women, that in this simple and easy manner we can diagnose pregnancy, since the daily reduction figures always remain constant. In the case of an early pregnancy in a healthy woman with a balanced endocrine system, we find daily constant reduction figures of 155 (youthful gravid women) to 165. From the 2nd till the 7th or 8th month this figure is constantly around 160, rising towards the end of the pregnancy to 155. Shortly before delivery these figures drop to around 165, often showing oscillations immediately before the birth of the child. It may be assumed that the decline, and the oscillations immediately before the birth of a child, are connected with the changed hormone-production of the hypophysis, the placenta, the decidua and the corpus luteum verum. By this simple method the differential diagnosis between fibromyoma, grossesse nerveuse, and pregnancy, can easily be made. Also the diagnosis of extra-uterine pregnancy and a carneous mole becomes simpler in this manner. Slight differences of about 5 seconds a day, the reduction number being then usually a little higher in the evening than in the morning, are not of any importance for judging the curve. Yet it is advisable to ascertain the daily reduction figures preferably at the same hour, and, if great accuracy is demanded, to perform the examination in a dark room, or by artificial light.

The questions which remained to be answered were: how quickly by this method can we ascertain the change in the cycle, due to the pregnancy? Is this reaction quicker than that of the Aschheim-Zondek[5] method or not? Even if these two methods were equally quick, then this simple examination, which can readily be mastered by any doctor, deserves the preference. It has also been proved that this method is faster (cycl. 4 and 5).

The following observations, made with a young woman who already had two healthy children and desired a third, clearly answer this question. I assisted her at her last confinement, which was normal. The husband and wife are very intelligent; he is 30, and she is 25 years old. She has a perfectly normal nervous sytem, is healthy and strong, and free from any autosuggestion. For these reasons her subjective complaints and remarks deserve our undivided attention for the scientific records. After the birth of the last child, which is nearly one year old, she always used an occlusive pessary, by which for

the time being pregnancy was prevented. During a month the cycle curve was now recorded. During the following month the first ovulation was awaited (cycl. 4), when, at about 10 a.m., on the 11th cycle day the reduction number, which the day before was 143, had dropped to 152, the ovulation diagnosis was made, and we could assume that the ovum had become free about 12 to 18 hours previously. In the afternoon at about 3.30 p.m. coitus took place for the first time during the entire month without the use of an occlusive pessary, so that the conclusion could be drawn with fairly great certainty that the fertilization, if any, could only have taken place by this intercourse.

Later the patient became pregnant. If we assume (like Miculicz, Radecki, Stöckel) that the spermatozoa can have arrived at the ampullary end of the Fallopian tube within two hours, then the fecundation took place on the same cycle-day, most likely before 6 p.m. The curve continued in a normal way during the 11th, 12th, 13th and a part of the 14th cycle-days (cycl. 4). This is probably the time during which the ovum had not become embedded, when in any case the influence of the fertilized ovum is not yet so strong as to cause hormonal changes in the maternal organism. On the 13th cycle-day the reduction figure was taken at 10 a.m. and also at 8 p.m. The difference between these two figures was insignificant. On the 14th cycle-day, at 10 a.m., the reduction figure was still 145. But at 8 p.m. something out of the ordinary happened. The figure rose for the first time during the entire cycle to 140. On the 15th cycle-day, at about 10 a.m., the curve dropped to 165, and in the evening even to 175. A glance at the cyclogram convinces us how entirely different this course was as compared with the previous month. While this curve had risen to its highest point of 140 during the previous evening, it dropped the next evening to the very lowest point of 175, which figure is seen only during or before the menstruation, but never during the intermenstrual time. The next morning the reduction figure was 165; in the evening it was again 175; on the 17th cycle-day it was 175 for the first time in the morning and in the evening. During the 3 following days the figure remained stationary at 175, then going up slowly, first between 165 and 170, remaining finally constant between 160 and 165. The maternal organism, therefore, first needs some time to adjust itself, during which it adapts itself to the hormonal influences which are changed by the pregnancy. Then the hormonal balance becomes constant, due to complementary and antagonistic influences of the

hypophysis, the ovaries, the corpus luteum, the chorion and the decidua.

By this vital reaction pregnancy can be assumed on the evening of the 3rd day after fertilization (Fig. 4B) by the unusually high position of the figure; on the 4th day pregnancy can be assumed with greater probability by the unusual decline (C); one day later (D) pregnancy can almost be diagnosed with certainty. If we are very cautious we record the curve two or three days longer. If this line remains constantly low (D.E.F.), then there is no doubt that the diagnosis of early pregnancy is correct. With a woman, having a cycle of 31 days, if she has been fertilized during the first ovulation, we can consequently determine the diagnosis with absolute certainty on the 18th or 19th cycle-day. This is then 7 or 8 days after the fecundation, and about 12 days before the next menstruation. With a woman having a cycle of 28 days, who has been fertilized at the first ovulation, we can diagnose consequently 9 to 10 days before the expected menstruation. If the fecundation takes place at the second ovulation, then 6 or 7 days later the diagnosis is certain. In any case the diagnosis of pregnancy can be made before the next menstruation fails to take place. Only in the case of men and women in the post-climacteric age is there a similar constant reduction in the figures, which then, however, are around 145. The constant figures of 165–170 ascertained on 4 to 5 consecutive days indicate with certainty the diagnosis of pregnancy both during the intermenstrual time and during the menstrual time when the bleedings are absent. The diagnosis is absolute because here a vital change of the cycle is concerned which otherwise does not occur in a sexually mature woman.

It is important to mention the subjective symptoms which are usually disregarded by women, or for which, as a rule, some other explanation is given, because, *inter alia*, such an early pregnancy has never yet been described. On the 12th and 13th cycle-days (4A and B) the patient noticed a greater secretion of mucus, at C frequent micturating, intermittent secretion of mucus, pain and tension in the breast, at D the same symptoms and moreover a feeling of tension and swelling of the external genitals, at E nausea, borborygmism, nervousness, fatigue, palpitations of the heart. On the 20th and 21st days (F) the nausea, fatigue and borborygmism increased. During this time the sensitiveness and the swelling of the breasts also persisted. Then the subjective phenomena gradually decreased. It seems that exactly the first accommodation goes

combined with a stronger reaction of the organism on the nidation of the ovum. Cyclogram 4 shows the further course of events. The daily reduction figures afterwards remained constant around 162 and 165. While the menstruation had remained normal all the time it failed to take place at the expected time, which is also recorded in the cyclogram. Ten days after the absence of the menses, the controlling test of Friedmann[6] was made, which showed a positive result. At the time of writing this paper there had already been 3 months' amenorrhoea, and a bimanual examination proved that the patient has been pregnant for more than 3 months. Her reduction figures are now constant, round about 160.

The Method of Determination of Pregnancy described above has the following advantages:

1. It is extremely simple, so that every doctor can make this diagnosis with the aid of the cycloscope.

2. It is absolute, because this method is not based on biological animal experiments, of which a certain percentage will turn out positive and another percentage negative, but upon the endogenous hormonal changes in the maternal organism. Such changes are brought about by the hormone-reactions of the hypophysis, the ovaries, the corpus luteum, the chorion and the decidua, consequently they are vital changes due to fertilization.

3. By this method the diagnosis of pregnancy can be made more quickly than by any other. When by such a method we can declare that pregnancy exists there are not even any indications that permit of the application of the Aschheim–Zondek or Friedmann reaction tests, because even before menstruation fails to take place the spectroscopic diagnosis can be made. It would be interesting first to diagnose pregnancy with the cycloscope, and then to see if at such an early date an animal biological reaction can be shown to be positive.

In the case of young women who are pregnant, we often find higher reduction figures, namely from 150 to 160. Also during illness in a pregnant woman the initial time is moved up higher, for instance, in the case of most forms of anaemia, asthma, bronchitis, Basedow's disease, and tuberculosis. Inversely, for instance, in the case of diabetes, we found lower reduction figures, especially in those patients in whom the illness had not yet been treated with insulin or diet. Here also the daily constant figures indicate that the diagnosis of pregnancy can be made.

If there should be some doubt in the case of pregnant women who are suffering from some illness, then the time of observation can be extended by a few days.

A second interesting pregnancy is that recorded in the curve shown in Cyclogram 5. The figure shown here in the records of our observations which we are able to make only during the daytime, and for this reason the highest levels, and possibly also the lowest levels, as recorded on Cycl. 4, escaped notice in this case. The patient was fertilized on the 12th cycle-day. On the 19th cycle-day pregnancy could be ascertained with certainty. The patient had a fall on the 27th day, that is, on the 5th day before menstruation was expected; through this fall a bleeding from the genitals resulted. The course of the pregnancy and the subsequent abortion are shown in the cyclogram. Young chorion flakes and decidua were detected in the discharge. Women often tell us that when their menstruation is premature, it is more profuse and lasts longer than usual. Such premature menstruations are often caused by an interrupted early pregnancy, which pregnancy up till then had escaped detection.

Cyclogram 6 shows how the constant pregnancy cyclogram was changed after the abortion, consequently after the interruption of the pregnancy. This cyclogram refers to a woman, 23 years old, pregnant about one month, who miscarried after a long motor ride.

The instrument we use to determine the reduction figures of the cyclogram and with which we make the diagnosis of pregnancy is the cycloscope* (Fig. 9) or spectroreductometer. The cycloscope consists of a spectroscope, a lens, two rubber or metal cushions which press on the interdigital fold, stopping the circulation, each with an opening of six mm., a pair of forceps, and a light of about 150 candle power (an ordinary show-window lamp with a mercury mirror). After the oxy-haemoglobin stripes have been sharply put in focus, the light is switched off, usually for about 120 seconds, and then it is switched on again. In this manner the eye is more accurately adjusted for the determination of the reduction time. For our clinic apparatus was built by which, synchronously with the running of a clock, the reduction time was photographed on a narrow film. The films were then hung on a frame, the reduction time read out and copied on to a graph. This procedure also makes it possible to project the picture on a screen.

* Obtainable from Andersen & Polak, P. C. Hoofstr, 40, Amsterdam.

SUMMARY.

This paper describes a spectroscopic method, consisting in the daily ascertaining of the reduction figures of the oxyhaemoglobin, by means of an uncomplicated instrument, the cycloscope, in order accurately and in a simple manner:

(*a*) To determine when a woman ovulates, which is of considerable importance for many problems of conception.

(*b*) To make quickly and absolutely accurately the diagnosis of pregnancy, which from now on will be possible for any doctor without the use of a laboratory or animal biological reactions.

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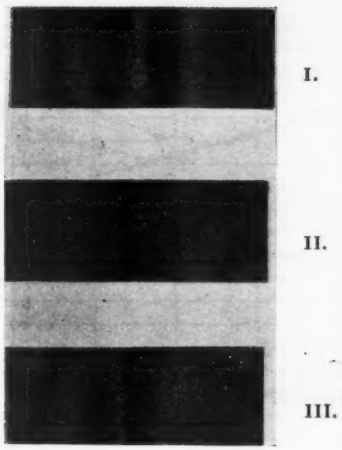


FIG. 1.
SPECTRA.

I. Oxyhaemoglobin.
II. Reduction.
III Methaemoglobin.

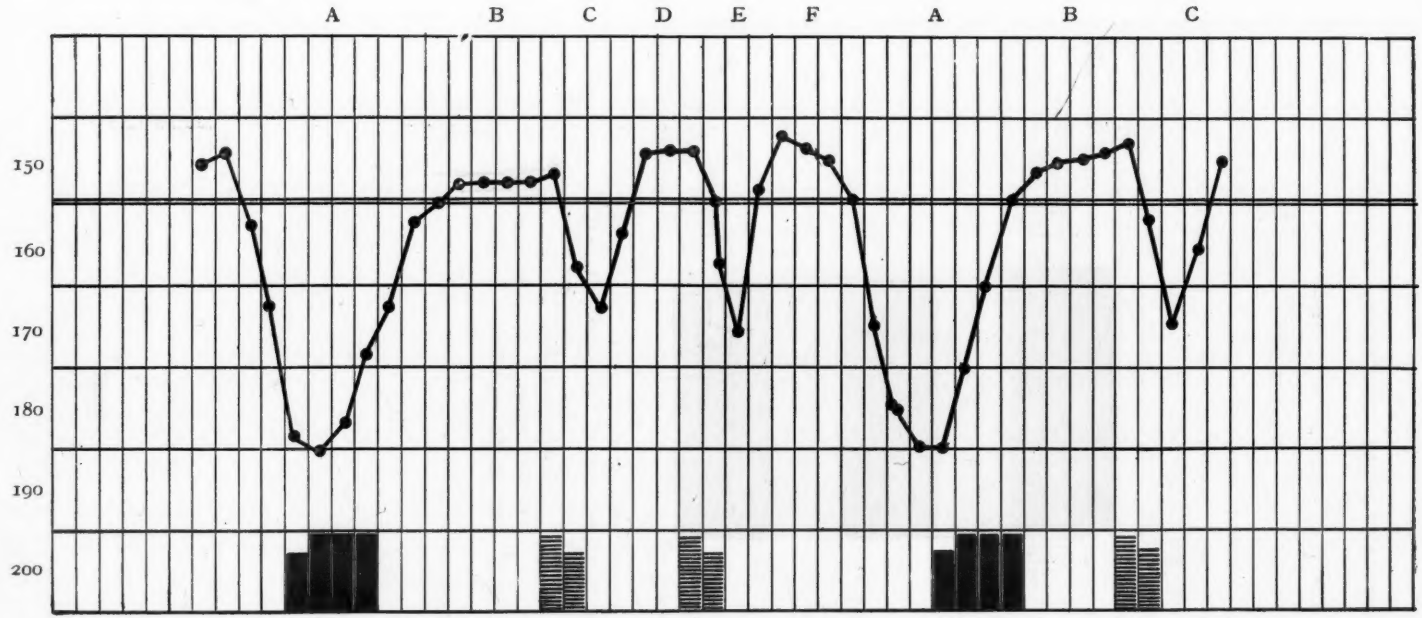


FIG. 2.

NORMAL CYCLOGRAM.

Menstruation.
Ovulation.
A. Menstruation decline.
B. First pre-ovular highest position.
C. First ovulation decline.
D. Second pre-ovular highest position.
E. Second ovulation decline.
F. Premenstrual highest position.

B. First pre-ovular highest position.

F. Premenstrual highest position.

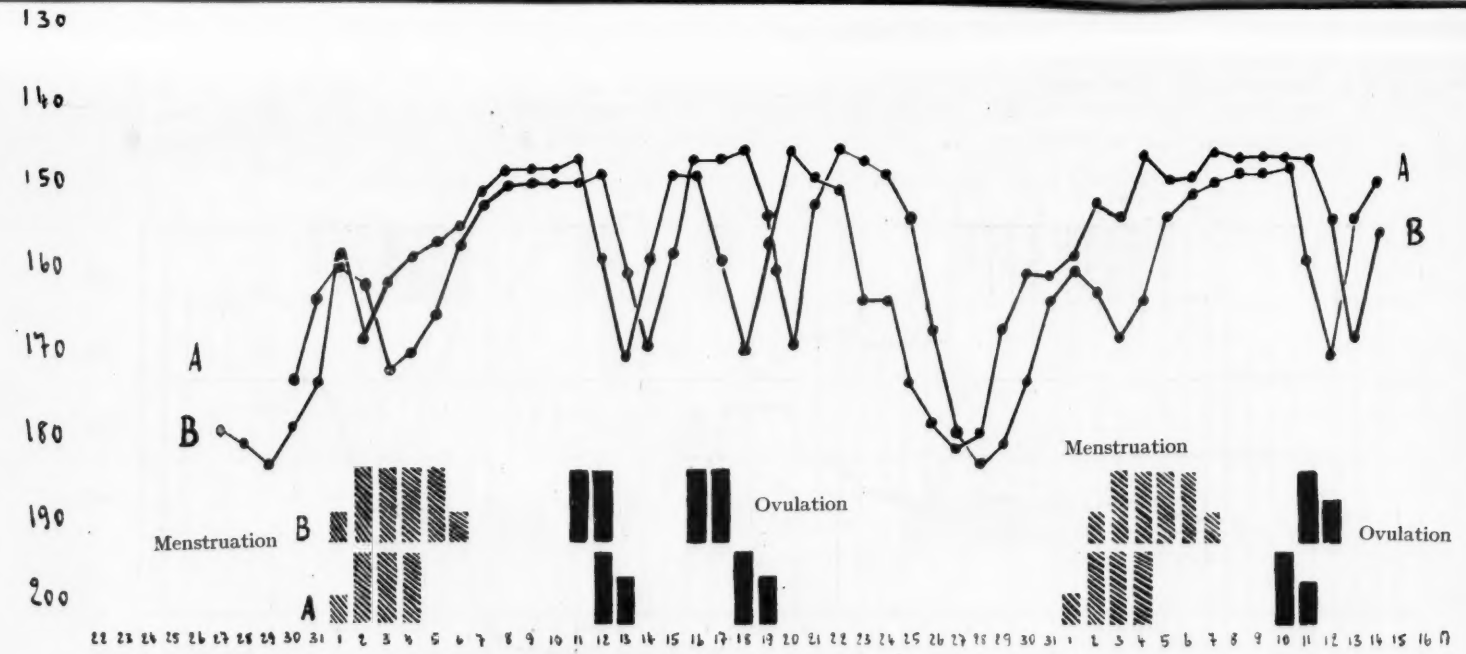


FIG. 3.

CYCLOGRAM OF TWO WOMEN WITH A CYCLE OF 31 DAYS.

— Curve of patient A, a nullipara, 28 years old.
— Curve of patient B, a multipara, 27 years old.
||||| Menstruation (lower) of patient A.
Menstruation (upper) of patient B.
■ Ovulation (lower) of patient A.
Ovulation (upper) of patient B.

Note similarity and dissimilarity of the 2 cyclograms, also in the case of the same woman during the first and second month. Compare these cyclograms also with a cyclogram of 28 days (Fig. 2).

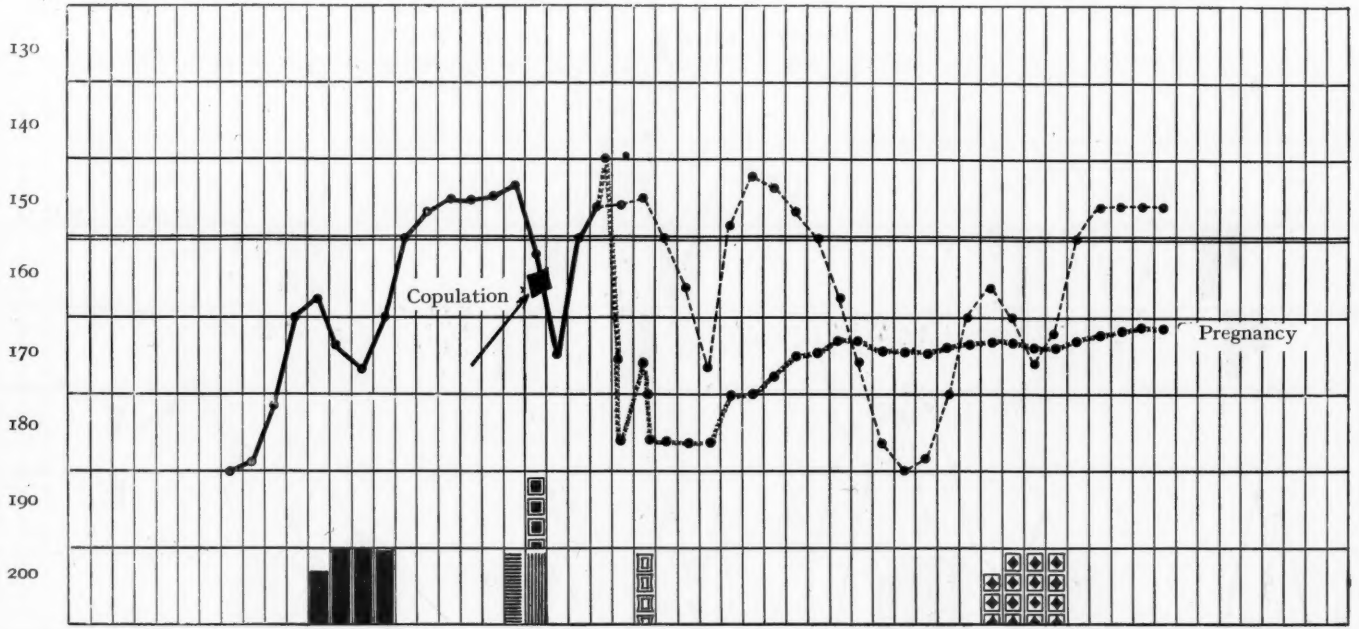


FIG. 4.

CYCLOGRAM OF A WOMAN WITH A CYCLE OF 31 DAYS BEFORE AND AFTER FERTILIZATION.

- Menstruation.
- First ovulation day.
- Second ovulation day.
- Fecundation of the ovum.
- ◆ Copulation (at 3.30 p.m.)
- ▣ Ovulation as per schedule if fecundation had not taken place.
- — Cyclogram before the fecundation.
- -- Scheduled curve of the past month.
- ++ Cyclogram after the fecundation.
- ◈ The menstruation which *failed to take* place shown as per schedule. Ten days later Friedmann's reaction was positive.

-- Scheduled curve of the past month.

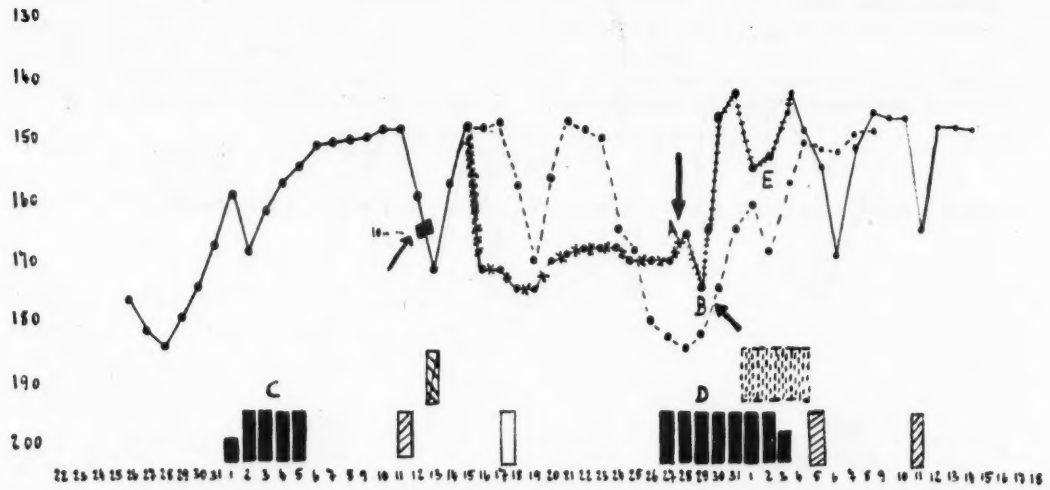


FIG. 5.

CYCLOGRAM OF YOUNG PREGNANCY AND ABORTION. CYCLE OF 31 DAYS.

Scheduled time of menstruation, if patient had not been fecundated.

Ovulation.

Scheduled ovulation time if patient had not been fecundated.

--- Scheduled curve of the past month.

Copulation at 10 p.m.

Fecundation.

— Normal cyclogram.

×× Curve after the fecundation (pregnancy curve).

++++ Curve of transition and abortion.

A. Beginning of the bleedings.

B. Foetus cast out, chorion flakes shown microscopically.

C. Ordinary menstruation (5 days).

D. Premature pseudo-menstruation (8 days) is actually an abortion.

E. Decline of cycle simultaneous with the actual menstruation.

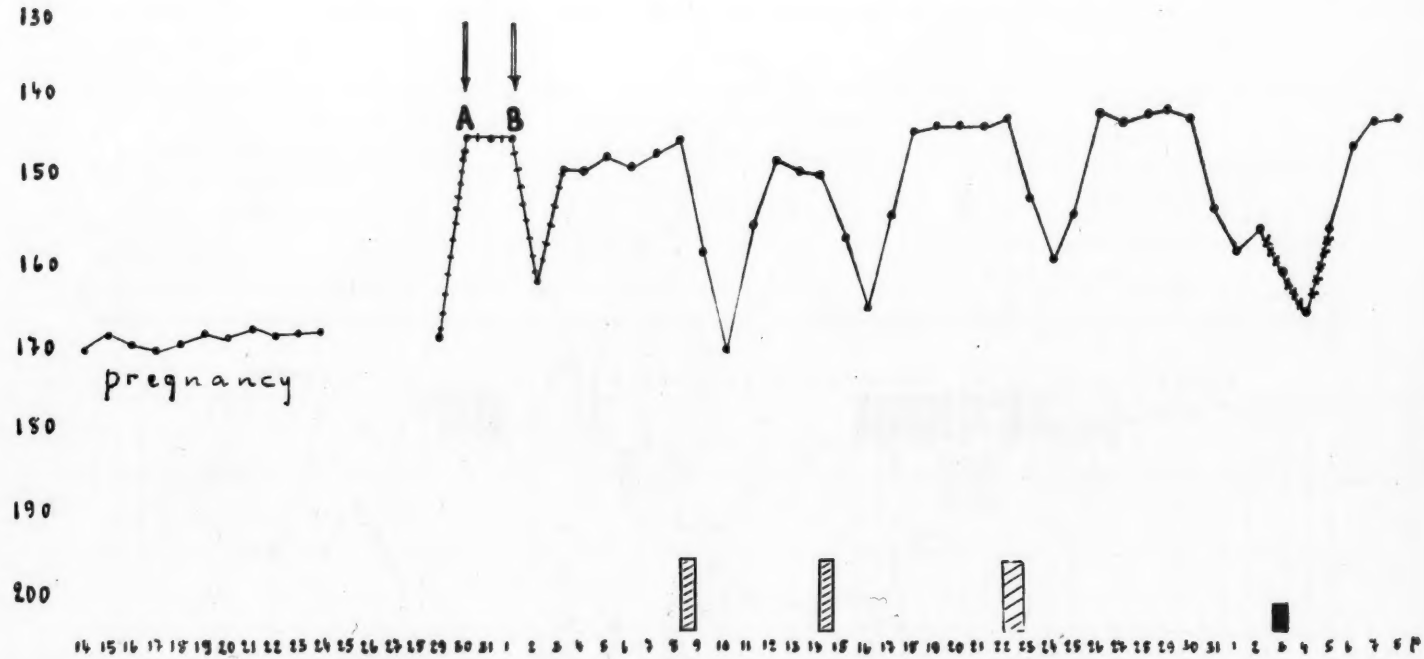


FIG. 6.

CYCLOGRAM OF PREGNANCY AND ABORTION.

- ▮ Menstruation bleedings about 1 month after abortion only ½ day.
- ▨ Ovulation (3 times).
- — Pregnancy curve.
- +++ Curve of transition and abortion.
- — Normal curve.
- ** Rudimentary menstruation decline.

A. Incipient bleedings, nausea and tension in the breasts disappeared; foetus probably died.

B. Foetus cast out, chorion flakes microscopically shown, then again normal cycle oscillations.

** Rudimentary menstruation decline.

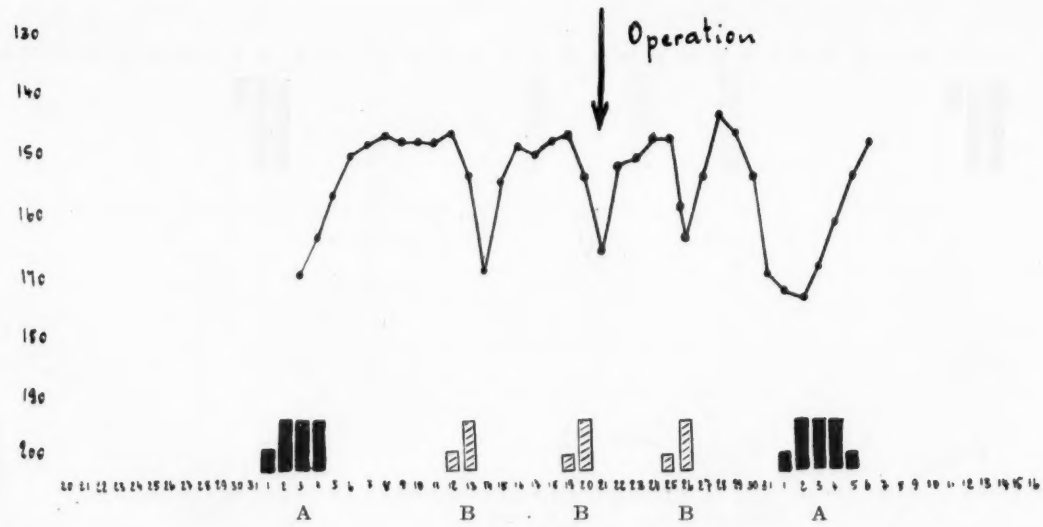


FIG. 7.

CYCLOGRAM OF A GIRL, 17 YEARS OLD, OPERATED UPON FOR CHRONIC APPENDICITIS DURING THE SECOND OVULATION.

A Menstruation.

B Ovulation (3 times).

In the right ovary a freshly burst Graafian follicle, in the left a fresh corpus luteum and a follicle in the course of development.

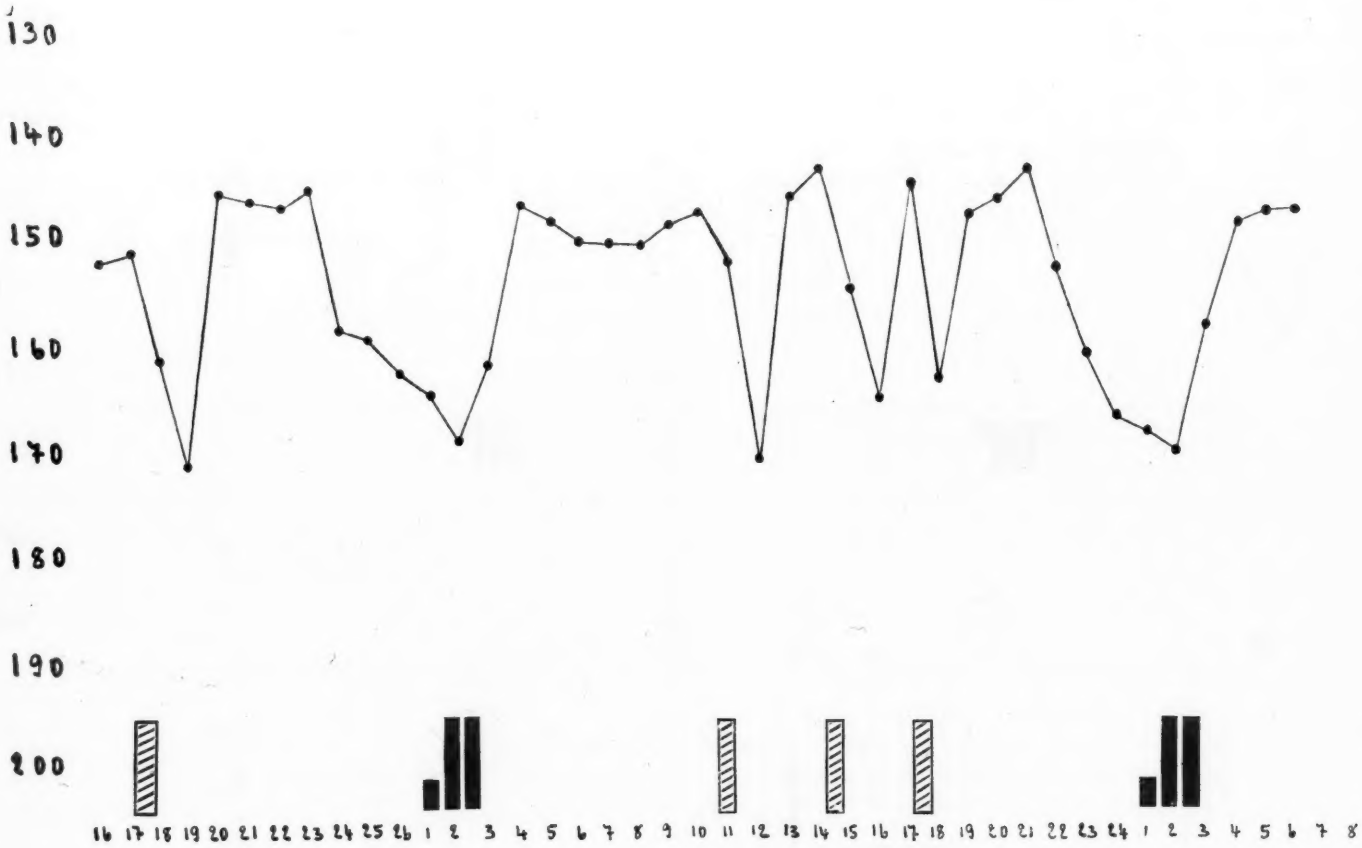


FIG. 8.

CYCLOGRAM OF A NULLIPARA WITH THREE OVULATIONS. CYCLE OF 26 TO 28 DAYS.

Menstruation.

A nullipara, 22 years old, who ovulated three times during the month recorded in this graph.

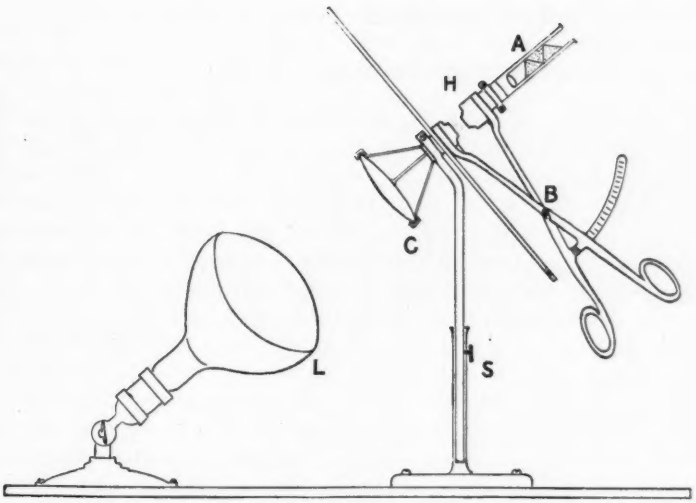


FIG. 9.

CYCLOSCOPE

A = Spectroscope C = Lens
B = "Pincette" L = Light
S = Pedestal.

The Intra-Abdominal Pressure in Pregnancy Newly Considered

BY

R. H. PARAMORE, F.R.C.S. (Eng.).

THE MANOMETER AND THE METHOD.

IN the spring of 1933, I commenced a new research into the intra-abdominal pressure in pregnancy. In 1908 and 1909, using a simple mercurial manometer with a rubber tube ending in a finger-stall, I had made observations of the pressure in the rectum in pregnancy; and in 1913, I had published my figures, and further had pointed to the changes of the abdominal parietes as evidence that the pressure in the abdomen and above the uterus is increased, and significantly, in pregnancy.[5] The idea that this and eclampsia are associated—that the visceral lesions and much else are determined physically, by pressure—burst like a bolt from the blue (1909). This idea, in its earliest form, was unrelated to previous opinion; of which, indeed, at the time, I was ignorant. I found it completely supported by the incidence of eclampsia (1921).[6] The attempt to unravel the pathological process on physical lines was thus natural. A mechanism for the renal lesion was worked out (1929); and the hepatic lesion explained (1932). But I had not measured the pressure in the stomach in the erect posture: nor had I measured the pressure in any case of large ovarian cyst. The research was precipitated by the statement, published in December 1932, that the intra-abdominal pressure is not increased significantly in pregnancy.[7] I put my work on post-partum eclampsia aside,* and began again almost at the beginning.†

* Dr. T. Watts Eden (1928): "The occurrence of post-partum eclampsia might be said to knock the bottom out of the mechanical theory at one blow."[1] R. H. Paramore (some time after 1928): "Post-partum eclampsia is only explicable on the mechanistic conception." (Unpublished.)

† "The very beginning was the elucidation of the meaning of the levator ani muscle (1910).[4] If the levator ani muscle is a pressure-resisting mechanism, there must be a pressure for it to resist; if this muscle hypertrophies in pregnancy, the pressure it resists must be increased in pregnancy."

This time I determined to do the thing thoroughly—as thoroughly as I could: but how measure the pressure within the abdomen in the living, intact woman? It has been objected that the pressure within viscera—e.g., within the rectum or within the stomach—cannot be taken as a measure of the pressure immediately outside these viscera—i.e., within the pelvis or within the epigastrium. In 1913 Glendining stated that " the only reliable method of obtaining information concerning this pressure was by some form of manometer introduced into the peritoneal cavity."[2] But such a method is quite impracticable: it is the living, active woman, standing erect, capable of making any movement—lifting, for instance, a bucket of water—who must be the subject of the inquiry. Acute Bright's disease in pregnancy—called eclampsia—occurs in the conscious active woman: if it be caused physically, the physics of the conscious, active woman must be considered. Thus, the only way of getting an idea of the intra-abdominal pressure—of one which could destroy the mechanistic conception—is by measuring the pressure within accessible viscera, the woman being conscious and in some active posture.

Nor is the objection to using the accessible viscera very well founded. It is true these viscera affect the reading—sometimes greatly: they undergo rhythmic and other contractions. At times they behave in an altogether unruly fashion—even though the rectum has been cleared by an enema, and the patient be fasting. Moreover, even when quiescent, their muscular walls present a tone which may be different at different times and under different conditions. But very little experience shows that such phenomena do not render the method useless. The effect of rhythmic contractions is small—nothing like that of posture. Peristalsis of the rectum, during manometric observation, in my experience, does not occur: nor is tenesmus complained of. The former, however—or a vomiting reflex—may show itself in the stomach. In one case there was a great and sudden rise of pressure, succeeded by a slow fall—the stomach behaved like the heart: systole was followed by diastole, the cycle slowly recurring. Unruly behaviour is uncommon; with experience it is less likely.

The tone of the viscera perhaps can be assessed. That of the empty rectum seems often negligible—otherwise, the pressure within the gut would not become so negative in the knee-chest position. In the lateral position the pressure is so small that one cannot believe the pressure about the gut is much less.

In the standing position pressure differences of several centimetres may occur: important as these may be, they are completely overridden by the differences between the non-pregnant and pregnant states. The way the pressure in the rectum varies with the posture of the individual puts out of court the idea that the tone of the rectum masks completely the intra-pelvic pressure—that the pressure within the gut is always something quite different from that in the pelvis about this viscus.

The case of the stomach is different. In the well-developed non-pregnant, standing woman the stomach has a considerable tone. But in the lateral position, Moritz found the intra-gastric pressure greater on the left side (reputed effect of liver weight) than on the right[3]—an observation I confirmed on my own person. Clearly, the tonic contraction of the stomach is not great enough to prevent changes of pressure about the viscus affecting the pressure within it. This at least is so in the lateral position: presumably it is so in the erect. Moritz found the pressure sitting different from the standing. If, then, the epigastric pressure is increased in pregnancy, the intra-gastric pressure should show it—certainly if the gastric tone of the non-pregnant state persists in pregnancy. A measure of the pressure within accessible viscera, before and during pregnancy, or during pregnancy and after labour, it seemed, should indicate an increase, if an increase occurred.

With such ideas I sat down to devise a suitable manometer. A vertical tube connected with the rectum by rubber tubing and a bag fascinated me: one would get a direct reading. What fluid should be used? Air, as the propagating medium, must be excluded: the fluid throughout must be incompressible. Since the intra-abdominal pressure, if related to any function at all, is concerned with the return of blood from the abdomen to the heart, I decided the liquid should be approximately of the same specific gravity as blood. In that way one could see at a glance the height to which a column of blood would be supported by the pressure in the rectum; and by using the X-rays one could see whether or not the pressure in the stomach supported a column of blood up to or above the diaphragm. The liquid must thus be visible by X-rays. A solution of bismuth was chosen: it was diluted to a sp. gr. 1050: it was coloured red to render it conspicuous.

It was clear the vertical tube, for measuring the pressure, would have to be fairly long: it would have to reach from the

rectum to the clavicle. One just over 60 cm., of fairly wide bore (1 cm., ext. diam.), was selected. It was called tube "A". A strip of lead, serrated in centimetres, with metal numbers at its side, served as a scale—almost as legible with X-rays as in daylight. The glass tube "A" was to be attached at its base with pressure-tubing ($\frac{3}{8}$ in., ext. diam.), ending in a thin-walled bag (a halfpenny balloon) to be inserted into the rectum. One had to arrange that the zero on tube "A" was level with the bag in the rectum: and further, that the bag when in place was neither collapsed, nor distended: under such conditions the height of the liquid in "A" would indicate the pressure in the rectum. It was clear that some means had to be taken to indicate the volume of the bag, hidden in the rectum. If the bag were collapsed the pressure indicated in "A" would be an underestimate of the pressure about the bag: if the bag were distended, its wall tense, the elasticity of its wall, would come into play and the pressure shown in "A" would be too high.

The problem was worked out on paper. It was easy to arrange that the bag should not become collapsed: it sufficed to add a reservoir, movable up and down, connected with the base of tube "A", and freely communicating with the pressure-tubing and the bag in the gut. But how prevent the bag from becoming distended? This was arranged by means of an inverted "U" tube, interposed between "A" and the pressure-tubing leading to the bag. It became clear that if the red fluid, propagating the pressure from the bag to tube "A", reached half-way up the two columns of the "U" tube, the volume of the bag would always be known. It sufficed to start the experiment by giving the bag a certain volume, in which its wall was flaccid—neither collapsed nor distended. The pressure-tubing was then clamped. One next made the two red columns in the "U" tube level. This was done by opening a tap connecting the two arms of the "U" tube at their base. This tap—tap "T"—was then closed. During an observation, the clamp having been removed, the reservoir was raised or lowered until the red columns of fluid in the "U" tube were level. One then knew that the bag had its pre-arranged volume—that it was neither collapsed nor distended. Moreover, since the columns of fluid in "B-C" balanced each other, the pressure would be indicated as before by the height of the fluid in "A" above the level of the bag. Experiment, as a matter of fact, confirmed the deduction.

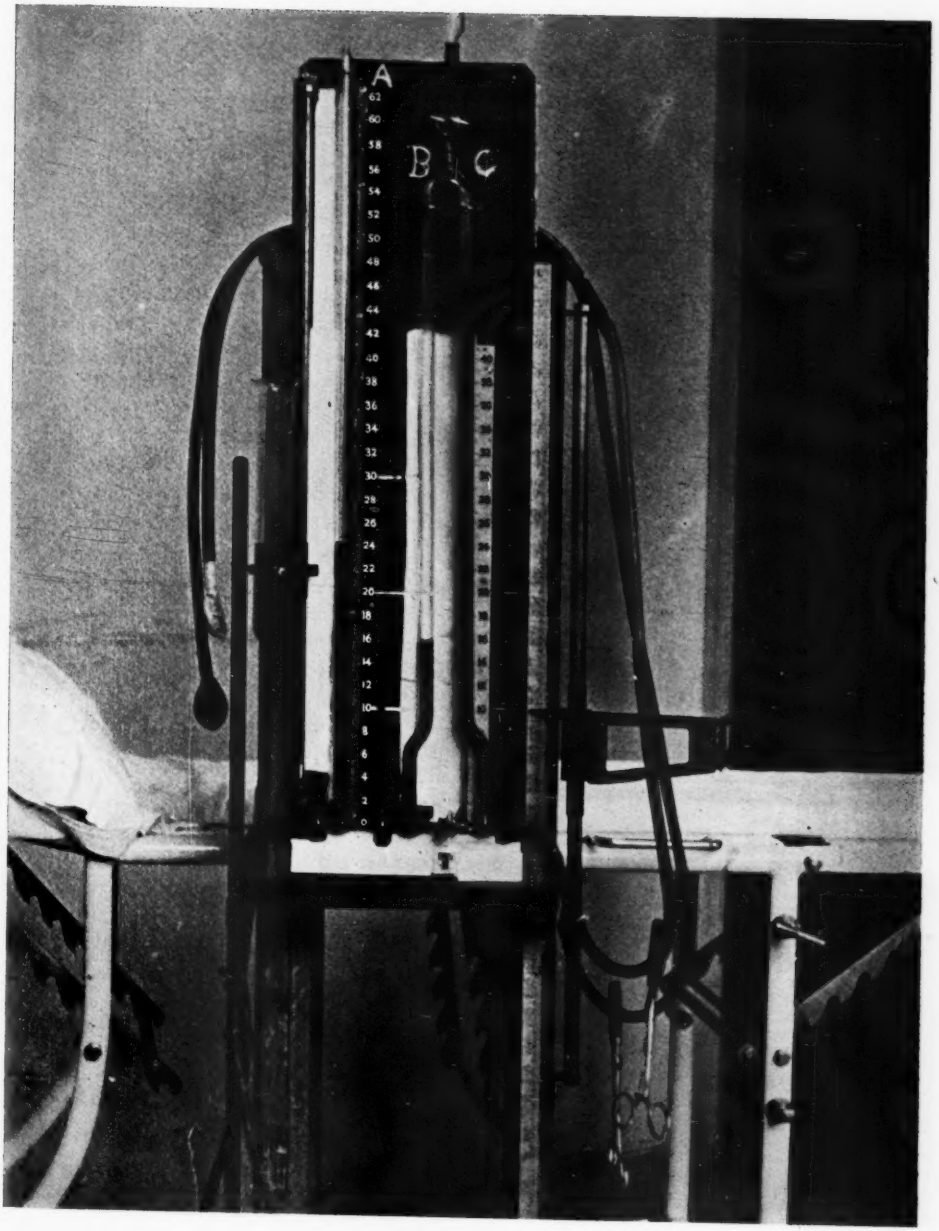
The "U" tube—called "B-C"—was so made that when the bag, with its prearranged volume, was collapsed (by pressure

of the hand), the fluid expressed from it, which entered arm "C", did not overtop into the other arm—arm "B". It was 54 cm. long; and its bore a little wider than that of tube "A". Further, the air in its upper part was replaced by a mixture of ether and liquid paraffin, which is colourless, incompressible, lighter than and not miscible with the red fluid, the bismuth solution. A small tube, closed by a tap, led from the upper convexity of the inverted "U" tube. Through this all air in the system was evacuated; and the buffer fluid—the ether and paraffin mixture—introduced.

One thus had a means of measuring exactly the pressure in the rectum, provided the zero of the manometer were on the same level as the bag. In the lateral position this was easy—the zero of the manometer was made level with the anus. In the knee-chest position and also in the dorsal decubitus the anus was again chosen as the base, though such a level was not quite accurate. The bag was introduced with the patient in the lateral position. The bag was first collapsed. The clamp on the pressure-tubing was removed, and the bag compressed by the hand. The red fluid in "C" went up: that in "B" went down. The clamp was then re-applied, the anal canal dilated by means of a bivalve speculum, and the bag introduced. The speculum was withdrawn, the clamp again removed, the zero of the manometer made level with the anus, and the pressure read.

The zero of the manometer was made level with the anus by means of a pointer, flexible in the horizontal plane, and movable as a whole vertically: one could slide it up and down on a rod attached to the frame in which the manometer was mounted. This frame was supported by the floor; and within it the manometer was freely movable, up and down. The manometer was counterpoised so that it would stay in any position. The pointer having been made level with the anus, the manometer was moved upwards or downwards until its zero—the real zero or an arbitrary one—became level with the pointer. Next, the reservoir was raised or lowered until the red columns in "B-C" became level with each other: then the pressure was read.

After the pressure had been observed in the lateral, knee-chest, and dorsal positions, the patient got off the couch and stood up. During this manœuvre care was taken that the weight of the tube did not displace or pull out the bag. The patient, bare-footed or in stockings, stood by the side of the manometer. In this, the standing position, the zero of the manometer was placed one inch below the level of the pubic crest. This was



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chosen because in one X-ray the bag in the rectum appeared to be about one inch below the pubic crest. The position of the pubic crest was noted by means of the pointer and a scale on the frame, measuring in inches from the floor. This was done to facilitate comparison of a present finding with one to be found on a subsequent occasion; for though the pubic crest is fairly easily discernible in the non-pregnant, it is somewhat obscured in late pregnancy. In this way one tended to eliminate error, though the tilting of the pelvis in pregnancy was disregarded.

The same precedure was followed as with the other positions. The zero of the manometer having been fixed, the reservoir was adjusted until the red columns in "B-C" were level: then the pressure was read. To ensure that communication was free, one often asked the patient to cough: a sudden impulse was propagated to the manometer, the red fluid in "C" going up, that in "B" going down, and the fluid in "A" and also in the reservoir being affected. One noticed that after the cough the return to normal was slower than the displacement, as though the impact had stimulated the rectum slightly to contract.

The gastric pressure came next. This was taken only in the standing position: and here also the zero of the manometer was one inch below the pubic crest. The zero level being the same as for the rectal pressure, the columns of fluid supported first by the pressure in the rectum, and then by that in the stomach, could be compared. In a perfect hydraulic system these should be equal. In late pregnancy they often were very nearly equal.

At first, having measured the pressure in the rectum, the bag was withdrawn; and, using another tube and bag, the pressure in the stomach was measured. But I soon improved on this. Instead of one pressure-tubing leading from the manometer, I substituted two. I introduced a Y-shaped connexion between the manometer and the two tubes—one for the rectum, the other for the stomach. The tube for the rectum was black and its bag dark blue: that for the stomach was light brown, and its bag white or yellow. Each tube was five feet long, $\frac{3}{8}$ inch external diameter, and each had its own separate clamp (enterectomy clamps). In this way, with both bags in place, I was able to take the pressures in series—first the rectal, then the gastric, then the rectal again, and so on, as often as I wished—and this, without disturbing the patient in the least.

One started by giving to each bag a certain volume—one in

which the bag wall was flaccid. The stomach tube remaining clamped, the pressure in the rectum in the several positions was taken in the manner already detailed. After the rectal pressure in the standing position had been observed, the rectal tube was clamped at a moment when the two red columns in "B-C" were level. The prearranged volume of the rectal bag was thus conserved. The stomach tube, with its attached bag, was then passed. The patient sat down: the pharynx was cocainized: the clamp on the stomach tube released: the stomach bag collapsed (by the hand): and the clamp re-applied. The bag and the adjacent part of the tube were lubricated—in some cases with glycerine, in others with liquid paraffin. The patient opened her mouth, and the bag was inserted. She was told to close her lips about the tube, but not to grasp it with her teeth, and to swallow. The tube was pushed down. Most often the tube went down without trouble. Some patients refused: others said they could never do it: in those who said they would try success was usual. The tube was passed in this manner in 9 non-pregnant women: in 8 women in late pregnancy: in 6 other cases of late pregnancy in which the examination was repeated after delivery: and in a further 8 cases—in some before and after delivery—in which X-ray films were made: that is, in all, in 22 different pregnant women. The tube was also passed in this manner in 2 cases of large ovarian cyst, both before operation and about three weeks after.

After the tube had been passed the patient rested until the nausea had subsided. When she was ready she stood up: the clamp on the stomach tube, if not already released, was now removed: and without changing the position (the height) of the manometer—i.e., the zero of the manometer being as before, one inch below the level of the pubic crest, in which it remained throughout all further observations—the height of the column of fluid supported by the gastric pressure was read. The method was just the same as with the rectal pressure. The reservoir was adjusted until the red columns in "B-C" were level—or, if they were swinging, as was often the case, from respiratory movements, one waited until they were swinging equally. The figure obtained was put down as the "gastric pressure".

Then the rectal pressure was taken again. The stomach tube was clamped at a moment when the red columns in "B-C" were level—conserving thus the prearranged volume of the stomach bag: the clamp on the rectal tube was released: the manometer

remaining unmoved, the reservoir was raised or lowered as before: and the rectal pressure read again. On again clamping the rectal tube when the red columns in "B-C" were level, and opening the stomach tube, etc., the gastric pressure could again be read. In this way one obtained values which could be compared. Not only could one see whether or not the rectal pressure had varied during a period of time, and whether or not the gastric pressure had remained constant; but, of very great importance, one could compare the heights of the fluid supported first by the rectal pressure and then by the gastric pressure, two or three times, with each other.

That in a perfect hydraulic system these should be equal can easily be demonstrated. If in a tall jar, almost full of water, the two bags are inserted—the one near its base, the other just beneath the surface of the water—one finds that the column of fluid in the manometer supported by the pressure in the lower bag is the same as that supported by the pressure in the upper bag. Another and rather spectacular way of demonstrating the same thing is by taking the pressure in the lower bag, and then raising this bag, by traction on its tube, to near the surface of the water. The column of fluid in the manometer, in tube "A", registering the pressure, scarcely alters: and yet, as the bag is raised, the pressure in it gets less and less. The fluid in "A" does fall slightly, but that is because the water in the jar also falls slightly as the tube is withdrawn to raise the bag. The part of the tube withdrawn possesses volume.

In this experiment, with the zero of the manometer level with the bag before it is raised, the column of fluid in "A" represents the absolute pressure in the bag—and the pressure about the bag. But when the bag has been raised, though it supports a column of fluid to the same height as before, this column of fluid by no means represents the absolute pressure in the bag in its new, elevated position—nor the pressure about the bag. To get the pressure in the bag in its present position either one must raise the manometer until its zero is level with the bag, in which case the fluid in "A" will have greatly fallen; or, maintaining the manometer in its original position, one must raise the pointer to the bag level, and subtract the number marking this level—an arbitrary zero—from that registering the top of the fluid in "A".

In the body, to get the absolute gastric pressure, the same manœuvre must be made. Clearly, the fluid column supported

by the gastric pressure, the manometric zero being 1 inch below the pubic crest, does not represent the absolute gastric pressure. This must be remembered in reading the Tables. The figures inserted under the heading "Gastric pressure" do not indicate the absolute gastric pressures. To obtain these one must measure the height of the fluid in "A" from the level of the bag. One must thus see the bag in the stomach. That is easily done by X-rays: either a screen is used, or a film taken. It was done in several cases.

In a hydraulic system the pressure is the resultant of two forces: (1) of gravity on the contents, and (2) of the forces applied by the walls of the container. In the case of the jar mentioned, the pressure can be increased either by adding more water or by pressing on a piston fitting into the upper part of the jar. The increase of pressure in each case can, of course, be measured; but there is this essential difference between the two cases. Though the pressure at the bottom of the water in the two cases should be the same, the pressure at the top is different. In the first case, the pressure at the summit of the column of water, however increased by additional water, is still atmospheric; in the other the pressure at the summit of the water, its height unchanged, is as much greater than the atmospheric pressure as the pressure on the piston determines. Naturally, the two factors can be conjoined: if the contents increase and the walls of the container resist the increase, so much the more will the pressure throughout the system rise. If the walls give way, so much less will the increase in pressure be.

Let me illustrate this by an example. In a case of large ovarian cyst, which on removal weighed 23 pounds, the rectal pressure supported the fluid in "A" up to 40 cm.; while the gastric pressure supported the fluid up to 42 cm., the zero of the manometer in each case being 1 inch below the pubic crest. This is as much or is more than in many cases of pregnancy; but in the following case, one of twins, the figures are similar. In this case the rectal pressure was 41 cm., the gastric pressure 42 cm. At first sight one would say there is no difference between the two cases, so far as the intra-abdominal pressure is concerned. X-ray films, however, showed that in the ovarian cyst case, the left cupola of the diaphragm was 2 to 3 cm. above the fluid in "A"; while in the case of twins, the left cupola was 2.5 to 4 cm. below the fluid in "A". Thus, unless it can be shown that the tone of the rectum and stomach in the case of

pregnancy was greater than in the case of ovarian cyst, one must conclude that in the case of pregnancy the epigastric pressure was the higher.

There is another remark to make. The abdomen is not like a butcher's shop with the various viscera slung up here and there. Sections of the frozen abdomen show all the viscera in apposition, their surfaces facetted. This is a pressure effect; it is only consonant with the play of a pressure. It is in virtue of this pressure that the veins are supported, so that the blood forced into them from the periphery, instead of collecting, flows onward, back to the heart. Otherwise, the inferior vena cava, for instance, would only operate as a conduit if its own walls came into play, i.e. when distended. Unless the abdomen were a hydraulic system the upright posture and carriage of man would be impossible. After all, the brain must be supplied. In all active postures the brain is at the top, and the effect of gravity on the blood-stream—on the venous blood-stream—on the venous blood-stream in the abdomen—on the return of blood to the heart from the reservoir for the blood—has to be overcome.

Nor is this all. In all active postures, the resistance to the blood-flow peripherally is greater than during passive states and much increased in movement. To overcome this the aortic pressure must be higher; and since the arterial walls are elastic, there must be more blood in the arterial system. Thus the heart must put out more blood per unit of time: thus the volume of blood returned to the heart per unit of time must be increased. This increase of blood comes from the veins: mainly or wholly from the veins of the abdomen. During active posture, and much more during active movement, these veins must be the more compressed. The abdomen reacts during activity, not only to give stability to the body, but for this end: the veins themselves, in virtue of their walls, can scarcely be supposed capable of the necessary response. The intra-abdominal pressure is indeed concerned with the return of blood to the heart; but is it not a question of just overcoming gravity—the weight of the blood—it is a question of permitting man to deal with his environment.

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APPENDIX.

The figures herewith published were obtained by manometry during the first phase of the research. This period extended from August 31st, 1933, to October 3rd, 1934. The cases have been classified into tables, as follows:

TABLE I: Rectal pressures only: 20 cases.
TABLE II: Rectal and gastric pressures. Non-pregnant: 9 cases.
TABLE III: Late pregnancy: 8 cases.
TABLE IV: Late pregnancy; 6 cases also examined after delivery.

The other 8 cases of pregnancy examined by manometry and X-rays formed the second phase of the research. The figures for these, and for the two cases of large ovarian cyst (which did not appear before 1935), will be published subsequently.

TABLE I.—RECTAL PRESSURE ONLY: 20 OBSERVATIONS.

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth			Height			Rectal Pressure						Gastric Pressure	Remarks
								Thoracic base	Abdomen	Pelvis	Upper border of symphysis	Diaphragm cupola Right	Diaphragm cupola Left	Knee-chest	Sims'	L.L.	Back: Knees bent	Back: Legs straight	Standing	Standing	
1	5	1933 Sept. 19	Miss M.	26	Non-pregnant; tall and thin but fairly robust.	ft. in. 5 9	—	—	—	—	—	—	—	-2	—	8	—	22	50		5 weeks after Gilliam's operation.
2	10	Oct. 10	Joan V.	19	Appendicular colic; slender; flat-chested.	ft. in. 4 11	—	—	—	—	—	—	—	-12	-4	8	15	22	28 29		
3	8	Oct. 2	Mrs. P.	30	Pernicious vomiting; 10 weeks since last period.	—	—	—	in. 26	in. 32½	—	—	—	-7	2/3	7	—	12	30		1 child 2½ years ago.
4	16	Nov. 2	Mrs. C.	28	Pernicious vomiting; about 9 weeks pregnant; admitted October 20th.	—	—	—	in. 32⅜	in. 35¼	—	—	—	-13	7	8	—	20	34		
5	56	1934 May 30	Mrs. N.	35	Persistent vomiting; 3 children, last 4 years ago; last period April 2, 1934; expecting January 1935.	—	—	in. 26⅜	in. 25½	in. 30½	—	—	—	-8 —	0/1 -2	2 4	— 9	— 8	21/22 (nearly fainted) —		Abdomen carinated. Upper surface of abdomen at 10 cm. in dorsal decubitus.

TABLE I. (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
6	6	1933 Sept. 22	Mrs. I.	39	Multipara; early pregnancy; hyperpiesis; induction.	Big, strong woman		—	—	—	—	—	—	-4/-7	7	11/16	—	20	44		7 previous pregnancies all miscarriages, except first, which was eclamptic (? at 6½ months). Blood-pressure 205/115.
														(Marked respiratory excursions in knee-chest position)							
7	11	Oct. 10	Mrs. S.	31	Early pregnancy; 3 months.	ft. in. 5 6	Heavy	—	—	—	—	—	—	-22	4	9	28/29	26 (sitting, 36)	35		
8	27	Nov. 21	Miss J.	28	Unmarried; pregnant 6 months; last period May.	—	—	—	—	—	—	—	—	-2	8	15	34	38	60 (level nearly with clavicle)		While lying on back level of fluid 12 cm. above highest point of abdominal surface.
														-3	—	—	—	—			
														(Could not get patient to swallow tube)							
9	37	1934 Jan. 23	Mrs. H. née J. (*see* No. 27, above)	28	Pregnant; expects end of February; no pathological signs; looks very well.	ft. in. 5 3½	st. lb. 9 6	in. 31	in. 37	in. 36	—	—	—	-0.5	—	14	47/48	48	—		
														+0.5	—	18 (second reading)	38/39	36	58/58		
10	7	1933 Sept. 22	Mrs. W.	44	8½ months pregnant.	ft. in. 4 10	—	—	—	—	—	—	—	-16	8	10/12	—	22	36		

TABLE I. (*continued*).

TABLE I. (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1933																			
11	29	Dec. 1	Mrs. S.	62	Marked ascites; wasting of limbs and thorax; ruptured ovarian cyst.	—	—	—	—	—	—	—	—	+6 +7	17 18	16 17	— —	26 28	40 44		Abdominal muscles taut. Operation December 4th. Commenced with spinal anaesthesia; cyst peeled off abdominal wall; spinal anaesthesia began to wear off; general anaesthesia; struggled; died on table.
		1934				ft. in.	st. lb.	in.	in.		in.		cm.								
12	54	May 25	Miss. W.	37	Pseudo-mucinous cyst and ascites.	5 0⅞	10 11½	34	36½	—	30½	—	40	-4	20/22	21/22	29.5	33/34	43/44		Would not swallow tube. Note: fluid in "A", standing above level of left cupola. On raising head, linea alba and flanks bulge.
		1933					st. lb.		in.	in.											
13	15	Oct. 31	Mrs. B.	31	Impending prolapse.	—	16 0	—	—	—	—	—	—	-10 -11	—	6	18	18	38		
								lying down,		44½											
								standing,		45½											
,,	,,	Nov. 28	,,	,,	14 days after posterior colporrhaphy.	ft. in.	st. lb.		in.	in.				-2	6	8	23	30	40		Lying in bed, with legs raised off table—62.
						5 7	16 0	—	43½	44½	—	—	—	-3	7	—	24	31	—		
14	28	Nov. 28	Mrs. S.	45	Cystocele.	ft. in.	st. lb.		in.	in.	—	—	—	-9	-1	3	—	20	36/38 39/41		Slight tenesmus present. Gastric pressure not taken.
						5 6	10 3	—	34	37½											

TABLE I. (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1933				ft. in.	st. lb.	in.	in.	in.											
15	18	Nov. 7	Mrs. C.	38	Ptosis; stomach dilated.	4 11	6 0	—	—	—	—	—	—	-14	5	5	—	16	25		Curtis advised. Abdominal muscles weak.
							lying down,	26¼													
							standing,	25¼													
16	26	Nov. 21	Mrs. S.	—	Ptosis of right kidney.	ft. in.	st. lb.		in.	in.				-18	-4	zero	—	16	30/31		
						5 4½	8 3	—	25½	33											
17	12	Oct. 11	Mrs. M.	56	Well-built woman; uterine haemorrhage.				in.	in.	—	—	—	-6	5	10	18	20	38		Abdominal muscles good. X-rayed standing. Column above level of diaphragm; during X-ray pressure sank to 32, but rose again. ? due to excitement of department.
						—	—	—	32	37½				-8	6	12	—	—	40		
																			36		
18	17	Nov. 3	Mrs. G.	58	Uterine bleeding.	ft. in.	Over				—	—	—	-1	10	18	—	25	46		
						5 2	16 st.	—	—	—				-2							
19	30	Dec. 12	Mrs. C.	63	Very stout; ? hypernephroma	ft. in.	st. lb.	in.	in.						(Rectum contained faeces)						
						5 1	13 9	37	47	—	—	—	—	—	20	18	—	37	39		Specific gravity of blood 1050. On back fluid level high above highest abdominal point.

TABLE II.—NON-PREGNANT. RECTAL AND STOMACH PRESSURES: 9 CASES.

TABLE II.—NON-PREGNANT. RECTAL AND STOMACH PRESSURES: 9 CASES.

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1933				ft. in.															
20	4	Sept. 19	Mrs. W.	35	4-para.	5 0½	—	—	—	—	Not screened.			−8	2/6	8/12	—	22/26	36		Abdominal muscles weak; bulging. Standing with belt 38 cm. Pressing lower abdomen with hand as does Curtis support, stomach pressure increased to 34 cm.
,,	,,	,, 28	,,	,,		—	—	—	—	—	—	—	—	(Stomach tube passed)						30/29 26/30	
21	9	Oct. 3	Miss F.	17	Nullipara; amenorrhoea;	ft. in. 5 1½	—	—	—	—	—	—	—	−12	5	—	18	21	35		The lower reading for the rectal pressure, standing, is probably the more correct.
														Rectal tube removed; patient taken to X-ray department and tube reinserted							
,,	,,	,, 4	,,	,,	not pregnant; anaemia.	—	—	—	—	—	—	—	?32	—	—	10/11	20	22	37/32	28	Gastric pressure in horizontal position of body; zero of manometer level with table. Relative values: lying on back, 14; left side, 23; right side, 4/6.
														(Rectal tube removed; stomach tube passed)							
22	20	Nov. 14	Mrs. H.	32	1-para; cervical erosion.	ft. in. 5 1	st. lb. 8 2¾	— —	in. 27	in. 35½	— —	— —	cm. 34	−20 −21	−2 —	4 6	— —	9 10	27 —	27	Stomach tube passed after rectal pressures had been taken and rectal tube removed.
23	33	Dec. 15	Miss P.	16	Nullipara; appendicular colic.	ft. in. 5 4	st. lb. 8 9	— —	in 28	in. 34	— —	— —	cm. 34	−18 —	−6 −7	−3 −4	13 —	13 —	21 —	37 38	

TABLE II (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1934																			
24	**40**	**Feb. 20**	**Mrs. S.**	**35**	**1-para 7 years ago.**	ft. in. 5 2	st. lb. 6 8½	in. 23½	in. 24	in. 31¼	 32⅜ —	 — —	in. 45¼ (expiration) 44 (inspiration) 30/32,5 cm.	-18 -19	-1 —	2 —	13 —	13 14	24/25 19/21	24/25 32/33 36	**The lower values are to be accepted.**
		1933																			
25	**24**	**Nov. 21**	**Miss W.**	**18**	**Well developed; athletic type.**	ft. in. 5 4½	st. lb. 9 7	 —	in. 29½	in. 37½	—	—	—	-17	-4	6/7	17	20/21	34		**Abdominal muscles good. The rectal pressure, standing, is too high.**
„	**25**	**Nov. 28**	**„**	**„**		—	—	—	—	—	—	34	32	-8 —	-2 -3	8/9 —	22 —	28 —	30/31 32/33	34/35	**The rectal pressure, standing, is again too high.**
		1934																			
„	**—**	**May 13**	**„**	**„**		—	—	—	—	—	Not screened.			-17	—	6	—	—	28/29 22	34/36/33 36/37 32/33	**On drinking water, stomach pressure fell to 27 cm. Surface of abdomen—dorsal decubitus at 12 cm. Both from cinema film.**
„	**58**	**June 17**	**„**	**„**		—	—	—	—	—	„	„		-6	—	7/8	14/15	14/15	27 24 23	26 28	
26	**42**	**Mar. 8**	**Mrs. S.**	**35**	**Multipara; thin; bright; Caesarean hysterectomy for valvular disease (1933).**	ft. in. 4 11½	st. lb. 6 10	in. 27	in. 25½	in. 30⅞	—	—	in. 42 (from floor)	-17	-6	-4	13	13	21	25/27	
														With Curtis support in position ..					27/28	30/31	*Effect of Curtis—increase both in rectal and stomach pressure.*

TABLE II (*continued*).

for valvular disease (1933).

30/31 Effect of Curtis—increase both in rectal and stomach pressure.

TABLE II (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1934																			
27	44	Mar. 27	Mrs. F.	44	4-para; headaches; bilious attacks; despondent.	ft. in. 4 11	st. lb. 9 0	in. 30	in. 32½	in. 36	in. *29½	— —	— —	-12 -14	2	6	18	20	34/36		Abdomen big, muscles weak; bulges on standing.
,,	48	April 12	,,	,,	Slight cystocele; slight incontinence of urine.	ft. in. 4 10	st. lb. 8 13	in. 29¾	in. 32½	in. 36½	in. *30⅛	— —	cm. 32	-10/-12	7/8	10	24	25	34/36 34/35	34/35	Surface of abdomen (dorsal decubitus) 14 cm.
,,	53	May 9	,,	,,	Anterior colporrhaphy, April 23.	ft. in. 4 10 —	st. lb. 8 9 —	in. 30½ —	in. 34 * 36½ (on standing)	in. 35 —	*31	—	31.5/30	-6	2/3	6.5/7	18,5/19	20 16	32 29.3 29.8 28,5 29	30 29/29 5 28† 27/28	† After drinking a little tea; at first, great excursions.
,,	55	May 27	,,	,,	Patient's general condition much improved.	ft. in. 4 11	st. lb. —	—	—	—	Not given			-5	—	6	20/22	22/19	34/35 38/40 40	34/35 40/44	Viscera unruly; enema had been given.
,,	59	June 17	,,	,,		—	9 7	—	—	—	— * These should all be the same.	—	—	-13	—	6	17	17	32/30 30 31	32/34 32/34	These figures are more acceptable. Both from cinema film.
28	63	Aug. 23	Miss C. W.	20	Nullipara; appendicular colic.	ft. in. 5 4	st. lb. 9 9	in. 29¼	in. 28¼	in. 34⅛	in. 32⅜	— —	— —	-18	-4	4	10	14,5	28 28 After adjusting platform for X-ray 31/32 29/30	31/32 31,5/33 32/33 33/34	Abdominal muscles good. Prepared in hospital. Cup of tea for breakfast; no dinner. Examination 2 to 3 p.m.
,,	64	Aug. 27	,,	,,	Nullipara; appendicular colic.	—	—	—	—	—	in. 32⅞	cm. 36 (X-ray photo)	— —	-16	2	9	14	18	30 26 30	32 34 34/33/32/31/30	Repeated because X-ray photographs had disappeared. Surface of abdomen, dorsal decubitus, about 11 cm.

TABLE III.—LATE PREGNANCY: 8 CASES.

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1933				ft. in.			in.												
29	3	Sept. 26	Mrs. W.	25	Multipara; near term; parturated	4 11½	—	—	37½	—	—	—	36	-2	—	10	—	—	46		Y-junction not in operation.
"	"	Sept. 28	"	"	October 1.															38/40	Not X-rayed.
30	19	Nov. 10	Mrs. H.	35	Primigravida; near term; (delivered on November 23 under spinal anaesthesia with forceps).	ft. in. 4 10½	—	—	in. 42	—	—	—	—	-16	8	13	—	30	47	39	Y-junction not in operation. First, rectal tube passed;
														-10	9	15	—	31	48	40	then this was removed, and stomach tube passed.
		1934				ft. in.	st. lb.	in.	in.	in.	in.			-8/-9	6/7	10	16	16/17	38/39		
31	43	Mar. 15	Mrs. C.	26	2-para plus 1 miscarriage; was about 8 months' pregnant.	5 3½	9 1½	30	36	36½	31¾	—	39						58/48	42/44	Delicate woman. ? Big child.
"	45	Mar. 31	"	"	Head in mid-pelvis; os admitted finger.	—	—	in. 31¾	in. 35½	in. 35½	—	—	—	1/2	16/17	21	30	—	54		An enema was given; measurements at 3.30 p.m.
"	49	April 14	"	"	Expects April 15 to 17.	—	—	in. 31	in. 36⅞	in. 36½	—	—	—	-10	10	10/11	32,5	—	—		Refused to swallow tube. Some descent of pelvic floor.
														—	—	—	30/31	29/26	58/52		

TABLE III (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1934				ft. in.	st. lb.	in.	in.	in.	in.			−11	4	2	25/26	25/26	36/37	34/38	
32	50	April 17	Mrs. S.	37	2-gravida; near term; pendulous abdomen; first child 5½ years ago.	5 3	8 8	29½	37½ (on standing, 40½)	32½	32	—	—	−12					35/36 36/35/33 40	36 36/37 38/39	Marked diastasis of rectum. Highest point of abdomen when on back—26 cm.
,,	51	April 18	,,	,,							—	—	34/32	−11 −12	13/14 10	10/11 —	32 —	26/26.5 22/23	35/36 38 34/35	36/38 36	Examined at 2 to 4 p.m. Had beef-tea only at mid-day.
33	52	April 25	Mrs. W.	19	Primigravida; 28 weeks.	ft. in. 5 1½	st. lb. 8 6	in. 28¼	in. 31½	in. 34	in. 30	cm. 39	cm. 38	−16/−17 6 −15/−16 10/11		11/12 —	22 —	27/28 —	40/41 38/39	44/45 48	Examined at 2.30 to 3.45 p.m. Had no dinner. Diaphragm obviously pushed up. Standing, lowest rectal 34, mostly 38.
,,	52	May 27	,,	,,	33 weeks.		st. lb. 8 8	in. 30	in. 33	—	—	—	—	−8/−9	—	15/16	20	23	43 54/60/58 48/62/44 48	42 42/44 42 42/44	Figures from cinema film. Surface of abdomen at 19 cm. On drinking water, no certain fall of gastric pressure.
,,	,,	June 20	,,	,,	36 weeks; birth July 16, 1934; child 7 lb.	—	st. lb. 8 11 (on back) (standing)	in. — 30½ in. 28½	in. — 33½ in. 35	in. — 35 in. 35½	—	—	—	−14/−15		2/3	21/22	19	38/39 39	43/45 45	Figures from cinema film. Obvious bulging of abdomen forwards and downwards on standing.

TABLE III (*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thor. base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1934																			
34	57	June 13	Mrs. T.	32	Primigravida; 36 weeks; child born July 12; 6 lb. 8 oz.	ft. in. 5 0	st. lb. 7 3½	in. 28½	in. 32	in. 31⅞	in. 29½	cm. —	cm. 36	0	13 13.5	17	33	34	35/36 35 32	36/38 34/36/37 33/34 34	X-rayed. Admitted with persistent vomiting. As a result of this examination a recurrence of the vomiting and albuminuria occurred.
35	61	Aug. 15	Mrs. B.	31	Primigravida; 30 weeks.	ft. in. 5 0½	st. lb. 11 0	in. 34	in. 38	in. 39¾	in. 29 inspiration	cm. 40 cm. 37	— —	−3	16	15/16	25/28/26	30/31	48 48 46 45	46/47 48 46	Vomited when passing tube. Blood-pressure 160/90. X-rayed.
,,	65	Sept. 5	,,	,,	33 weeks.	—	st. lb. 11 3½	in. 34	in. 38⅜	in. 39	in. 29⅜	—	—	−12	11/12 9/10	9/10	16	16/17	42 44 42	46 47 50/48	The figures for the dorsal position probbably too low. Blood-pressure 130/80 (sitting)
,,	65	Oct. 3	,,	,,	37 weeks.	—	st. lb. 10 13	in. 34½	in. 38½	in. 38½	in. 29⅜	cm. 42 (X-ray photo)	—	−9 −10	10	9/10	18/19 19	21	43 34 33 40 31	48/49 50 50	In X-ray photograph of gastric pressure fluid stands at 46.5 cm.
36	62	Aug. 16	Mrs. D.	30	Primigravida; 30 weeks.	ft. in. 5 2	st. lb. 9 10 (on back)	in. — 30	in. — 36½	in. — 37	in. 30⅞	in. 46	in. 45 cm. 39	−4	12	15/16	32	32	43.5 44 50 48	43.5 43/44	Had a light and small meal at 11.45 a.m. Examined at 3 p.m. Upper surface of abdomen 21 cm. Blood-pressure 140/90. Urine 1010. No albumin. (Refused subsequent examination.)
							(standing)	in. 29½	in. 37	in. 36½											

TABLE IV.—LATE PREGNANCY; 6 OTHER CASES ALSO EXAMINED AFTER DELIVERY.

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back Knees bent	Rectal Pressure: Back Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1933																			
37	13	Oct. 17	Mrs. C.	36	2-gravida; 7 months' pregnant; well built; toxaemia; pruritus; lemon tint; albuminuria; blood-pressure 145/110 (sitting).	ft. in. 5 3	st. lb. 13 1½	— —	in. 39½	— —	— —	— —	— —	-6 -8	18 20	22 17/18	38 39	46 48	51 52	47/48 At first 54 After resting	Both obviously high above diaphragm.
														(Rectal tube removed and stomach tube passed; manometer at same level)							
,,	14	Nov. 16	,,	,,	Premature delivery; breech; November 4; living child, 5 lb. 10 oz.	ft. in. 5 3	st. lb. 11 0	— —	in. 34½ —	in. 40½ —	— —	— —	cm. 42 5	-9 -10	4 5	12	27	32	37	38 37	Y-junction in operation; both bags *in situ* at same time. Distance between ant. sup. iliac spines 10 inches.
38	22	Nov. 16	Mrs. R. W.	41	Ninth pregnancy; last regular period April 5th; 7 months' pregnant; admitted with early rupture of membranes and transverse lie.	—	—	—	in. 34	in. 36	— —	— —	cm. 34	-4	12	18		27	44 34	39 36	Two tubes in position simultaneously for first time. Gastric pressure relatively higher than rectal in standing position.
,,	23	Dec. 19	,,	,,	Delivered of stillborn child 4½ lb. December 5th.	ft. in. 4 9	st. lb. 7 12	—	—	—	— —	— —	cm. 29 31	-13 -18	0 1	4 5	16 17	18 19	24 26	25 26	

TABLE IV.—(*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1933																			
39	32	Dec. 14	Miss E.	35	Triplets, 5/6 months.	ft. in.	st. lb.	in.	in.	in.			cm.	6	12	18	22	23	36	46	Sent in as a case of ? ovarian cyst. Laparotomy December 18 revealed pregnant uterus. Burst stitches December 25, and then Caesarean section. Blood-pressure 140/90.
						5 0	10 13	33½	39	39	—	—	38	8	14	19	23	—	37	42	
						(While lying on back, zero level with table, stomach pressure 35/36; rectal 28)															
		1934					st. lb.	in.	in.	in.			cm.	-17	0	4	18.5	18	24	35/36	
,,	38	Feb. 1	,,	,,	Caesarean section December 25th, 1933.	—	9 0	30	32	35	—	—	34			5			25	30/31	
																			23	29/30	
40	34	Jan. 3	Mrs. T.	32	3-para; fourth pregnancy; near term.	ft. in.	st. lb.	in.	in.	in.	in.			-4	10	17	25	30	40	42	Admitted with persistent vomiting of 3 weeks' duration.
						4 11	8 13	30	35	35	*29¾	—	?37						36		
														-6	2	9	16	20	30		
,,	39	Feb. 1	,,	,,	Delivered on January 19th; child 6½ lb.		st. lb.	in.	in.	in.	in.				11		26		42	30/31	* These two figures should be the same; since they are not, there is an error. The figures for the latter reading in the erect position are too high; one must take off 4 cm.
						—	7 12	28½	28	32½	*31⅜	—	33.5						26	29/30	
																			31	34	
																				33	

TABLE IV.—(*continued*).

TABLE IV.—(*continued*).

No.	Case	Date	Patient	Age	Condition	Height	Weight	Girth: Thoracic base	Girth: Abdomen	Girth: Pelvis	Height: Upper border of symphysis	Height: Diaphragm cupola Right	Height: Diaphragm cupola Left	Rectal Pressure: Knee-chest	Rectal Pressure: Sims'	Rectal Pressure: L.L.	Rectal Pressure: Back: Knees bent	Rectal Pressure: Back: Legs straight	Rectal Pressure: Standing	Gastric Pressure: Standing	Remarks
		1934						in.	in.	in.	in.		cm.								
41	35	Jan. 11	Mrs. R.	38	2-gravida; 32 weeks' pregnant; first child April 1925.	ft. in. 5 2	st. lb. 10 7	32	37	37	32¾	—	36	6/7	12 14	19 20	29 30	32	45 46 42/44 36/38	46 48	Had pre-eclampsia with first pregnancy at 7 months. Child grew up mentally defective and died when about 10 years of age.
,,	66	Sept. 12	,,	,,	Delivered by pubiotomy under spinal anaesthesia on March 17, 1934.	—	—	in. 26¾	in. 28¾	in. 35	in. 32¾	cm. 37 (X-ray photo)	—	−8	−6	8	13	13	32/31 30 30 30/31	34* 44† 36 36	Had had a good meal at noon: examined at about 2.30 to 3.30. No vomiting, no retching, paraffin used to lubricate tube; no salivation. * Stomach tube at 24 inches from mouth: † at 21 inches.
42	46	April 5	Mrs. C.	23	Primigravida; 36 weeks.	ft. in. 5 2½	st lb. 9 2½	in. 31½	in. 33¼	in. 35½	in. 32¼ — cm. 37/36 (by deduction)	in. 45⅛	in. 44⅛ (from floor) —	−10 −14	6 7	11	18	20	45/46 36 34/36 36/37 37/38 36/38	38/40 37/39 36/37 37/38 38/39	Examined 2 to 4 p.m. Patient had had no mid-day meal.
,,	60	June 20	,,	,,	Delivered under spinal anaesthesia with forceps May 8; child 8 lb.	—	st. lb. 8 9	in. 29	in. 28	in. 33½	in. 32½	—	cm. 35	−16	−2 −3	2 3	10 11	13.5	20 21 22 21/22	26/28 28 27/29	On expanding chest gastric pressure fell to 24 cm. and rectal pressure to 18/19 cm. On screening, stomach bag a long way down, near upper pelvis.

The Immediate Cause of Menstruation

BY

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WHILE studying the causes of necrosis the writer's attention was drawn to the phenomena of menstruation. He arrived at some tentative conclusions as regards parts of the cycle which are not generally formed but seem to him plausible and may be of interest to gynaecologists.

True menstruation is limited to the human species and certain monkeys. These species are polyoestrous, the oestrus cycles being consecutive and continuous. The object of menstruation appears to be rapid clearance of the products of a cycle when complete so that a new cycle may start. Simple atrophy of the elements would be adequate in monoestrous animals but would be too slow in the polyoestrous. Rapid necrosis of at any rate part of the endometrium is essential and this is known to occur.

During the premenstrual or progestational stage of the cycle immediately preceding menstruation when the proliferation is mainly glandular notable points are: the oblique passage of the ducts of the glands through the compact layer which must result in the closure of these ducts by pressure as the cells of the compact layer proliferate. Also the turgidity of the glands just before menstruation, which seems to indicate blockage of the ducts as well as increased secretion.

Menstruation begins with necrosis of the superficial layers of the compact stratum, and fragments of the endometrium can be found in the uterine cavity. At the same time a breach of the capillaries takes place, with resulting haemorrhage and small-clot formation.

The secretion of the glands is not liberated till the superficial layers of the compact stratum have necrosed. This secretion contains a tryptic ferment important for dissolving necrosed fragments and clots and so securing easy discharge. These fragments and clots could not form in the presence of the ferment-

containing secretion, and the latter, therefore, was not present at the commencement.

The phenomena indicate the presence of a substance destructive of cells, first appearing on the free surface of the endometrium and later penetrating deeply as the necrotic action progresses, and this cannot be derived from the uterine glands.

If such a destructive substance—or noxa, to use a general term—exists it should be discoverable in the menstrual discharge, especially on the first day of menstruation. The evidence for its existence is considerable, but not quite convincing.

First. Tradition asserts that during the period there is something toxic about a woman. Folklore on the Continent forbids the handling of fruit or flowers then, and declares that dough kneaded by a menstruating woman will not rise properly. It is also a common belief in some parts of the country that if a woman cures hams while she is menstruating the hams may be spoilt.

Second. The molimina point to a sort of toxaemia.

Third. Experimental investigations so far have given indecisive results. Schick[1] proved that in one woman the handling of flowers during the period caused them to wither long before they should do. Macht and Lubin[2] were so sure that they had proved an influence on the roots of growing shoots that they named the substance menotoxin. Their experiments have been repeated several times, and while some investigators have confirmed their results others like Mandelstamm and his collaborators[3], Freeman and Loomey[4] have denied the presence of such a noxa in the majority of women.

The impression left is that the rootlet method is too uncertain. Lanczos[5] used as test objects nerve-muscle preparations with positive results, and Mommsen[6, 7] the production of gas by yeast. Mommsen has worked out a method which he claims to be thoroughly scientific and applicable to even 0.15 c.c. of blood, the effect being greatest on the first day. A similar but smaller effect was found with circulating blood. Control experiments with men and women past the menopause gave negative results.

On the whole the balance of evidence is in favour of the existence of a noxa, but its amount varies with diet and with different women. It varies also with the period in the same woman.

The growth of the endometrium is analogous to that caused by auxetics, and such substances have been found in the Graafian follicle and its successor the corpus luteum.

In embryonic life the first trace of these is a thickening of the epithelium on the inner surface of the Wolffian body. The cells proliferate, and after breaking up into clusters these show primordial ova surrounded with undifferentiated cells. That the ova originate in the undifferentiated cells appears to be proved by the fact that those cells which have gone to form the medullary cords, and as a rule remain undifferentiated, may develop into typical oocytes which, however, degenerate *in situ*. That layer of undifferentiated cells which surrounds an oocyte develops as it develops and becomes the membrana granulosa. It follows that the cells of the granulosa are derived from the most primitive form of ova, were originally potential ova, and may preserve some of the qualities of ova. At any rate their close association with the ovum seems to indicate that they are essential for its development.

Later these cells develop in two directions; part remain in the follicle and become the true lutein cells, the remainder heaped round the ovum as the discus proligerus go out with the ovum as the corona radiata.

The discharge of the ovum from the follicle is put down to increasing tension with consequent rupture, but since a small depression forms before discharge, the stigma, the process does not look like a tear which should follow a bulge. The opening might be due to a liquefying necrosis, a sort of digestion.

It is believed that the ovum is discharged from the follicle about the fourteenth day and dies about the twenty-eighth if unfertilized. The question of its nutrition during this period has been raised. Even with the fertilized ovum the question applies before its implantation.

Three possible sources of nutriment have been suggested; the secretion of the uterine glands, glycogen of the endometrium, and the degenerating cells of the corona.

Of these the uterine gland secretion may be excluded since it does not escape till the compact layer breaks down. Glycogen is certainly found in the endometrium, but is likely to be required by the endometrial cells themselves. The endometrial tissue is in many ways analogous to tumour tissue. In tumours glycogen is found if they are growing rapidly or if they are degenerating. It is not found in slowly growing tumours. In the first it is obviously a store the energy of which can easily be drawn on, while in the second it appears to be the carbohydrate fraction of protein which is breaking up. Nutrition derived from degenerating corona cells is barred if the thesis of this paper be accepted.

But the question appears to be needless. There is evidence that like other mammalian ova the ovum contains in itself a store of nutriment. It is a body about 1/125 inch in diameter, while most bodily cells average 1/2000 inch. Its cubic content is, therefore, about 4000 times that of an average cell, so that ample space is available. It contains more than cytoplasm and nucleus, viz., deutoplasm, and where this borders on the cytoplasm yolk granules can be seen, giving the impression that these are derived from the deutoplasm. The deutoplasm and yolk layers occupy about 40 per cent of the whole ovum. Besides, the ovum does not grow in size appreciably until after the first divisions when fertilized. There does not seem any reason, therefore, to look for an outside store of nutriment for it.

The corpus luteum fully developed by the nineteenth day persists till the twenty-seventh or twenty-eighth, when fatty, followed by hyaline, degeneration sets in. With its death menstruation occurs. This is the normal cycle, but sometimes an infertile, or anovulatory cycle, occurs when a corpus is not formed, yet hyperaemia and some necrosis appear. In some way, therefore, the follicle or its secretion is connected with haemorrhage. Certain pathological conditions point to this. Folliculomata which arise from the granulosa cells are accompanied by a polypoidal condition of the endometrium and haemorrhage. Metropathia haemorrhagica, in which the ovaries are cystic and corpora lutea are absent, shows thickening of the endometrium, polypoidal formations, areas of necrosis and disintegration, and haemorrhage.

It is generally held that the endometrial changes during the menstrual cycle are a preparation for pregnancy. The early phenomena of pregnancy, therefore, bear on the question of the cause of menstruation.

The ovum passes through the stages of morula, where the cells seem undifferentiated, and blastodermic vesicle, where that portion of the wall was not taken up by the internal cell-mass and possessing two layers, ectoderm and endoderm, is thought to form the trophoblast with its two layers, that of Langhans', and the syncytium. Of these the syncytium has the power of eroding the decidua and so forming a nidus for the ovum, while Langhans' layer receives and passes on to the developing foetus nutriment derived from the maternal tissues. This is the accepted description, and it implies that both layers of the trophoblast are derived from the ovum.

But in the guinea-pig certainly, and probably also in the

human species, the fertilized ovum is still in the morula stage when it penetrates into the decidua. The erosion is said to be a sort of digestive action, a liquefying necrosis. Since the cells of the ovum are still undifferentiated an ectoderm-endoderm membrane is absent, and it is unlikely that the action can be attributed to the undifferentiated cells of the morula. At this stage the surface of the ovum is covered with a sticky albuminous coating, one of the uses of which may be to secure adhesion to the uterine wall. It seems a fair inference that the digestive power is exercised by this fluid. This fluid appears to be derived from the corona and it is stated that it is due to degeneration of the corona cells and is a source of nutriment for the ovum. But since the ovum does not seem to require outside nutriment its real function may be digestive. Since there was some evidence of this power at the discharge of the ovum from the follicle one may conclude that the power resides in the corona cells, living or dead.

The fully formed trophoblast is two-layered as described, and the liquefying power appears to belong to the syncytium which in this respect behaves in much the same way as a foreign body giant cell. Is it not possible that the syncytium is derived not from the ovum but from the corona, and that the albuminous fluid alluded to is a stage in the transformation of a cellular mass into a plasmodial? If this be correct the corona cells do not die in pregnancy but survive and are transformed.

A further argument for survival of these cells in pregnancy is the presence of oestrin in the placenta. This at first is regarded as being secreted by the cells of the granulosa. If granulosa cells survive in the placenta via the corona, it is easy to account for placental oestrin but difficult if they perish.

Transferring this hypothesis to menstruation, the strictly controlled necrosing power of the corona in pregnancy, used only where it is needed at one point of the decidua, is replaced by a flooding of the uterine cavity with the contents of the corona cells on their death. This would account for the widespread necrosis and its commencement on the surface of the endometrium. It may also be the cause of the death of the ovum. In pregnancy the corona cells survive, just before menstruation they die.

Accepting the hypothesis of corona survival in pregnancy it follows that the tissue must enormously increase in total volume. If the corona when discharged from the follicle possesses four or five layers of cells each about 1/2000 inch in diameter the total

bulk must be about that of the ovum or a little larger. But the surface area of the villi in the placenta has been reckoned as 6.5 square metres. The volume of the syncytium reckoned as one cell deep must then be at least 5,000,000 times that of the corona. The stimulus to this increase may come from the ovum, but it is possible that it comes from the spermatozoa otherwise unutilized, since one only in an ejaculation fertilizes the ovum. The corona cells were at first potential ova and may have preserved in some embryonic form the power of conjugation.

Somewhat outside the scope of this paper interesting inferences may be drawn on this hypothesis as to the value in pregnancy of the corona. The necrosing process penetrates through the compact layer but is stopped when it reaches the spongy layer and a deposit of fibrin, Nitabuch's layer, indicates the death of cells. It follows that the secretion of the uterine glands is a defence mechanism for the maternal tissues, probably acting through its tryptic ferment. If it fail placenta accreta may occur.

Later the trophoblast alters when equilibrium is established. Langhans' layer, derived from the ovum, disappears when the developing organs of the foetus take up the duty of elaborating the nutriment supplied by the maternal tissues, but the syncytium persists though it becomes merely a membrane lining the villous spaces comparable to endothelium. The uterine glands atrophy being no longer needed and the corpus luteum which developed and maintained them itself disappears.

Nevertheless some trophoblastic cells persist, though inactive, to the time of delivery. It is stated by some authors that separation of the placenta takes place at the junction of compact and spongy layers and not through the obviously weak spongy layer of the decidua. If so some weakening force must be present, and it is possible that this force is the last evidence of corona-syncytium action, the last service it can render to the ovum it has so long guarded.

Since throughout from its first appearance the ovum has been sheltered by the corona cells, or their ancestors or posterity, they are the true mother of the ovum and the woman who bears a child only its foster mother.

The chemical substance responsible for the necrosing action is unknown but there are certain indications.

If oestrin be injected into castrated monkeys for 6 to 8 days there is not any haemorrhage, but this appears after stoppage of the injections. Typical premenstrual changes are absent

unless progestin injections followed those of oestrin. Folliculomata and metropathia haemorrhagica when the follicles are involved are both accompanied by haemorrhage.

Therefore, in some way oestrin is related to necrosis and haemorrhage though its typical action is to produce hyperaemia and not haemorrhage.

Progestin, on the other hand, though it is generally regarded as a supplement to oestrin, shows in reality mainly a protective preservative power, since on it depends the development of the uterine glands, and it preserves the integrity of the endometrium. Only with its death does necrosis begin.

Another preservative action may exist if the hypothesis as to the corona be correct. While the ovum does not need any nutriment outside its own store the corona cells do not contain any store, and they are cut off from the lymph supplied to all its cells by the organism. Further, though in bulk they are about the size of the ovum, their metabolism must be much greater for the combined surfaces of them all must be 15 to 20 times the surface of the ovum, and it is in proportion to surface that chemical actions, mainly for nutrition, take place. If they are to live they must be nourished from external sources.

Now the epithelium of the Fallopian tubes consists of two kinds of cells, ciliated and non-ciliated, and the latter appear to be secretory. In the premenstrual stage of the cycle these project above the surface and are enlarged. By the time the menstrual stage is reached they have emptied. Since true decidual tissue can often be found patchily in the Fallopian tubes, and this is controlled presumably by the corpus luteum, it is a fair inference that the secretory cells in the tubes, like those in the uterus, are lutein-controlled. It is suggested that they supply the necessary nutriment to the corona cells.

If this action of the corpus occur then its excision should be followed by haemorrhage, the corona cells dying through failure of their food supply, and this actually occurs. Similarly destruction of the follicle, which contains cells similar to those of the corona, is equally followed by haemorrhage.

Progestin then cannot be the chemical responsible. Oestrin has a connexion but the substance cannot be oestrin itself since haemorrhage does not occur during the injections. It is suggested that it is a relative of oestrin, oestrin altered probably autolytically in normal conditions, or changed by some other process in pathological conditions like metropathia. It should then be a sterol derivative and a lipoid.

SUMMARY.

1. In polyoestrous animals rapid destruction of the products of one cycle is necessary to allow the next to start. Hence necrosis occurs rather than atrophy.

2. Menstruation begins with necrosis of the superficial layers of the endometrium. This cannot be due to the secretion of the uterine glands as this appears to be set free by preceding necrosis, and clots and fragments could not be formed in the presence of the tryptic ferment of the glands.

3. The phenomena indicate the presence of a substance toxic to cells, and this should appear in the discharge, but the evidence for its presence there is not conclusive.

4. Auxetics stimulating endometrial growth are found in the Graafian follicle and the corpus luteum. The cells of the follicle arise from undifferentiated cells, each of which is probably a potential ovum.

5. Some of these undifferentiated cells sheath the primordial ovum and develop into the membrana granulosa, and later into the corona radiata and the true lutein cells. They seem necessary for the ovum.

6. The stigma, which indicates the point at which the ovum is about to leave the follicle, may be due to a digestive process, a liquefying necrosis.

7. Attempts have been made to account for the nutrition of the ovum before its death, or implantation, in three ways, but none of these are necessary since the ovum contains in itself a store of nutriment.

8. Haemorrhage occurring in an infertile cycle when a corpus luteum is not formed, and in the pathological conditions of folliculoma and metropathia haemorrhagica, indicates a connexion between the follicle cells and haemorrhage.

9. In the first stages of pregnancy the syncytium and Langhans' layer are believed to be formed by the ovum, but when the ovum penetrates the decidua in the morula stage it is unlikely that the digestive power resides in it.

10. The ovum is at that period surrounded by an albuminous coating believed to be due to the degeneration of the corona cells. The digestive power may reside in it and, therefore, belongs to the corona cells.

11. It is suggested that the corona does not die in early pregnancy but persists as the syncytium, and that the albuminous coating is a stage in its transformation. The presence of oestrin in the placenta can thus be accounted for.

12. In menstruation the corona cells die and the interior of the uterus is flooded with their contents which by hypothesis have a necrosing power; hence the rapid necrosis of the endometrium beginning at the surface.

13. If the corona cells become the syncytium they must increase enormously in bulk. It is suggested that the stimulus comes from otherwise wasted spermatozoa.

14. In pregnancy the corona, or its ancestors or posterity, persists from the first appearance of the ovum till the delivery of the child and is necessary for the existence of the ovum and foetus.

15. Oestrin is in some way related to the chemical substance causing the necrosis. Progestin is not, or not so nearly related, since it has essentially a preservative action. Progestin may, by influencing the secretion of the Fallopian tubes, supply the corona with nutriment.

16. The chemical substance is probably a sterol derivative related to oestrin, and a lipoid.

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A Large Ovarian Cyst

BY

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ON July 17th, 1937, Mrs. S. B., aged 50 years, was admitted to the Surrey County Hospital with a diagnosis of ascites.

The patient stated that while she had always been stout she noticed an enlargement of her abdomen about 18 months ago; she attributed this to the strain of shifting a piano. She had been breathless since Christmas 1936, and the swelling had become so large that she was unable to stoop in order to put on her shoes, and had had to wear slippers. She was a multipara, and her children were aged 25 years and 16 years. Menstruation was normal until 8 months ago when there were two periods of amenorrhoea of 3 months' duration, but for the last 3 months the period had occurred twice every 28 days.

On examination a cystic tumour was felt which extended from the pubic symphysis to the xiphisternum. The circumference at the umbilicus was 64 inches and the patient weighed 20 stones 7 pounds. Marked oral sepsis was present and there was considerable oedema of the legs. A diagnosis of an ovarian cyst was made and an operation was performed in two stages.

On July 20th, under local anaesthesia, a midline incision of 2½ inches was made above the pubic symphysis and the peritoneum exposed after traversing 2½ inches of fat. The cyst wall was exposed and swabbed with iodine in order to obtain firm adhesions. The wound was then packed. A small cannula was introduced into the cyst, and the rubber tube leading from it partially occluded so as to empty the tumour slowly. Fifty-six pints of fluid containing traces of old blood were removed.

On July 24th, under general anaesthesia, the wound was excised and the incision extended. A very large partially collapsed right ovarian cyst was removed after separation of numerous adhesions, and the large thick pedicle was ligatured. The left ovary was small and fibrosed and only a very small quantity of free fluid was present in the abdomen.

The convalescence was uneventful except for some local suppuration in the fat of the abdominal wall at the lower end of the wound, and on August 8th the patient's weight was 12 stones 8 pounds 4 ounces, and the circumference of the abdomen at the level of the umbilicus was 43 inches.

The tumour removed was a cystadenoma, containing 15½ pints of fluid, making the total contents 71½ pints. All the fluid was contained in one large cyst, which had a smooth wall except for an area 6 inches by 4 inches where there was a collection of small simple cysts in the form of a plaque.

Large tumours have been recorded in the English literature by Everett,[1] "Ovariotomy for unusually large ovarian cyst" in a woman 73 years of age; recovery; amount of fluid totalled 40 pints. Heekes,[2] "Colossal ovarian cyst"; fluid amounted to 55½ pints. Barnett,[3] "Unusually large ovarian cyst"; 108 pints 12 ounces of fluid removed.

Tumours of this size have become rare in civilized countries and the 2-stage method of removal here described reduces the risk of shock and of dissemination of a possibly malignant tumour.

SUMMARY.

	Stones	Pounds	Ounces
Weight of patient before operation	20	7	0
,, ,, ,, after ,, ...	12	8	4
Tumour weighed	7	12	12

The fluid content of the tumour was 71½ pints, and it weighed 6 stones 5 pounds 6 ounces.

	Inches
Girth of patient before operation	64
,, ,, ,, after ,, ...	43
Reduction of girth	21

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A Method of Performing Lower Segment Caesarean Section, with Special Reference to a New Compressor Instrument.

BY

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The instrument, which is a compressor for the lower segment, is a modification of Victor Bonney's, but the method of use is essentially different. It is not always necessary to use it, but I should always prefer to have it handy. It is, however, especially useful in those cases which some authorities regard unsuitable for the lower segment operation; such as placenta praevia, breech presentations, and when the presenting part of the foetus floats freely above the pelvic brim.

It is in these cases in which very free bleeding is apt to occur on the first incision of the lower segment and may be so persistent that the incision has to be continued blindly until some part of the foetus can be seized and brought into the wound to arrest the bleeding.

In all these cases, operation, practically bloodless until the birth of the child, can be performed by the method described below.

My own small series includes examples of all the above mentioned complications, and the only cases I can think of which might be unsuitable for this method would be those in which a large cervical fibroid is the complication calling for Caesarean section, and cases of retraction ring.

The abdomen being opened by a sub-umbilical incision, the loose peritoneum above the bladder is incised transversely, allowing for an upper flap of about three-quarters of an inch, the lower flap being pushed down with the bladder, which is packed out of the way with a gauze roll.

The assistant, who stands on the patient's right, passes his left hand into the wound, so directing it that it passes upwards to clear the right broad ligament and then downwards behind the uterus into the pelvis. He then presses the presenting part forwards into the lower segment and lifts this into the wound in the most favourable position for operation.

The assistant's right hand is then used to press the ring of the uterine compressor on to the front of the already stripped lower segment, his left hand making counter pressure the while.

The operator then makes the initial incision into the uterus in the manner indicated in the drawing; a curved transverse incision with concavity upwards.

The incision, being practically bloodless, can be made with sufficient deliberation to avoid any possible injury to the foetus.

The compressor was originally made to open, as depicted in the diagram, the idea being that two pairs of Green-Armytage forceps could be applied, one to the upper and one to the lower margin of the wound in the uterus, and the compressor then removed without the necessity of passing the ring over the handles of the Green-Armytage forceps. This was, however, found to be unnecessary and the compressor is now made without any opening device.

The initial incision having been made, the compressor is removed, while the assistant, keeping up the pressure from behind, gently forces the presenting part into the incision now made in the uterus, so that haemorrhage does not take place.

It is at this stage that the two pairs of Green-Armytage forceps are applied to the upper and lower margins of the wound; these forceps are not necessary as haemostats as yet but are extremely useful, after the evacuation of the uterus, to bring the margins of the wound into easy position for suture.

The wound in the lower segment is then bloodlessly enlarged with knife or curved scissors, the assistant still controlling the haemorrhage by pressing the presenting part, head or breech, into the enlarging wound, thus enabling the operator to use the utmost precision and avoid any accidental damage to uterine vessels at the extremities of the wound.

Scalp forceps and short midwifery forceps are at hand if necessary to assist in the delivery of the child, but neither may be necessary as the head can generally be pushed through the opening by the assistant from behind. As the child is delivered the left hand of the assistant, already behind the uterus, eventrates it. The sister passes a hot cloth behind the uterus and the anaesthetist gives an already prepared dose of ergometrine into the tendon of the pectoralis major.

The child having been attended to, the placenta is delivered, the wound in the uterus is repaired in the ordinary manner and the operation is concluded.

The absence of bleeding was particularly noticeable in the

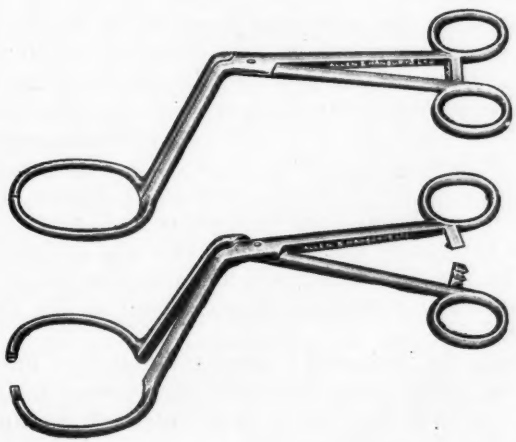
case of placenta praevia, when the placenta protruded into the wound quite bloodlessly, a swab not being necessary throughout the operation until the infant had been delivered, and after that there was the minimum of bleeding.

A colleague told me that his most difficult lower segment operation was one in which the head was impacted so firmly in the pelvis that he was obliged to have an assistant to push the head up from below with his hand in the vagina.

In one of my cases the head was impacted in the pelvis. I cannot say whether it was impacted so firmly as it was in my friend's case, but by putting my right hand into the pelvis of the patient behind the uterus, before commencing the uterine part of the operation, I was able to disimpact the head easily. I cannot say whether this would always be possible, but I can say from experience that the hand used from this position is a very powerful disimpactor.

The drawing was made from a small photograph taken during operation; the inset is merely a diagram to illustrate the action of the compressor. An attempt has not been made to show the reflexion of peritoneum.

My thanks are due to Mr. Victor Burnand, the artist, who made the drawing. The instrument was made by Messrs. Allen and Hanbury Ltd.



On Cross Section of the Perineum
A Simple Method of Limiting Rupture in Labour

BY

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So far as I know this method of limiting the extent of perineal rupture has not hitherto been described or advocated It is based on two familiar facts, that a fissure is more easily extended than started, and that it is arrested on its running into a cut at right angles to its course. These facts are well known to and utilized by workers in wood, glass, and fabrics. It is surprising that they should not have been applied to perineal flesh.

The vaginal orifice being distended, the smallest critical plane pertaining to the particular presentation being secured, and a favourable rate of advance obtained, whether by hand or by the forceps, any rupture that ensues will be inevitable and will occur in or near the middle line. Once started the rupture is fully occupied by the advancing head which thrusts its edges apart and at the same time presses downward on the perineum. Thus three divergent forces acting in planes at nearly right angles to one another bear simultaneously upon the apex of the rupture, a condition pre-eminently favourable to extension of the tear. If now a transverse incision be made through the entire thickness of the perineum, with its mid-point at the line of the rupture produced, then the rupture on extending will run into and be stopped by this cut, and a new and artificial perineal edge will be provided along which the ruptive forces will distribute themselves instead of being focused at the apex of a receding angle.

In incising the perineum I have not found an intravaginal guard for the child's head necessary, the perineal tissues being so tightly stretched that two or three cuts with the knife have readily divided them without injury to the underlying scalp.

The length of the incision must depend upon judgment of the circumstances of the particular case. It should be just long

enough to afford such distribution of the ruptive forces as will give reasonable security against the starting of a fresh rupture. I have made it from $\frac{3}{4}$ to $1\frac{1}{4}$ inch long in rough proportion to its distance behind the natural perineal margin. With shrinking of the tissues after delivery the cut becomes considerably shorter.

The site of the incision, too, is a matter of judgment of the stage of delivery at which rupture began, i.e. of its probable extent if unchecked. I have not made it less than just about an inch in front of the anterior edge of the distended anus in any case; in most cases it has been considerably farther forward. Experience of a few cases will enable one to decide on an appropriate site for the particular case.

Such an incision avoids division of muscle. It is parallel to the transverse perinei, it falls between and almost tangential to the anal and vaginal sphincters, and its ends fall short of the levatores ani, forced apart as these are by the bi-parietal diameter of the emergent head.

Episiotomy compared. For lateral episiotomy two advantages are claimed: (1) the direction of the perineal wound is lateral to the rectum instead of toward and it may be into it; (2) there is a clean cut instead of a tear. The avoidance of an opened rectum is an advantage too obvious to need comment. The second benefit is slight. The rupture of tissue as tense and tenuous as that of the distended perineum is little different from an incision and very different from laceration by a jagged object. It resembles the almost clean cut scalp wound from a blow with a hard blunt object. In my experience a perineal rupture, short of the anus, adequately cleaned and sutured, heals little if at all less kindly than a cut made by the scissors.

Compared with cross section, episiotomy has certain disadvantages. It is liable to ready extension, particularly if the cut be short. If extension occurs any advantage of a clean cut is correspondingly lost; while if the extension reaches the ischiorectal region some tearing of the levator ani is almost inevitable.

Episiotomy is performed before rupture occurs, to prevent or direct by anticipation a rupture thought otherwise to be inevitable. In some cases one can confidently forecast the occurrence of rupture, much less confidently its extent; in others one cannot foretell whether rupture will occur or not. It is not uncommon to hear surprise expressed at the occurrence or absence of rupture and at its extent. Anticipation cannot be absolute, and episiotomy may be superfluous in its performance or degree.

Experience and observation must be the basis of judgment as to its desirability in every case.

Cross section is never superfluous because it is performed only after rupture has begun; it does not facilitate extension of rupture but checks it; it does not involve division of muscle; it is a clean cut made with a knife. These features would seem to entitle it to a place in the management of the perineum.

The Surgical Treatment of Cysts of the Vulva and Vagina

BY

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THE common cysts of the female lower genital tract arise out of either deranged function of normally found structures, or from activity of embryonic rests. In the former group may be placed Bartholinian cysts, either simple or infected; suburethral cysts, simple or infected and Nabothian cysts, simple or infected. In the second group are the simple vaginal cysts, congenital cysts of the broad ligaments extending down the vaginal wall, and cysts from the remnants of Gartner's ducts. Few of these cysts ever exceed a tangerine in size. The accepted form of treatment, generally by excision, is usually so complicated and often disfiguring, whereas it might be so simple, that this consideration alone has prompted this short paper. The treatment in each case consists in either evacuation with destruction, or merely evacuation with fenestration. Whether the treatment should be the former or the latter, depends upon whether the cyst opens on to a skin surface, or on to a moist surface. The significance of that discrimination can be readily seen.

BARTHOLINIAN CYSTS AND ABSCESSES.

The operation at present in vogue in cases of Bartholinian cysts is excision. This involves an extensive dissection, bloody, and extending almost invariably into the vulva orifice and vagina. Healing is seldom primary and, therefore prolonged, and aesthetically, owing to its scarring and tell-tale deformity, leaves much to be desired. Moreover, in the experience of the writers, the vast majority of these cysts are not gonorrhoeal in origin. Many of them occur in young virgins, in whom venereal contact is out of the question. A Bartholinian cyst is a chronic

infection and the mistake is made in placing the gonococcus in a class *sui generis*, whereas other organisms of equal chronicity, and they are numerous, will produce similar local results. The recognition of these facts will frequently avoid the imposition of erroneous moral judgments.

The treatment recommended for a Bartholinian cyst is the same as that for an abscess. In the case of the cyst, an incision is made well out on the vulval surface, where the cyst can be made to protrude by pressure within the vagina. The incision should be long enough only to admit the little finger. An Allis forceps is now placed upon each side of the incision to include cyst wall and skin surface. The cavity is now explored with the finger. The skin surface is then thoroughly dried and a thick sterile vaseline is thinly applied to it, for protection. The interior of the cyst cavity is now cauterized, either by the twisted wire nasal cautery, or better still, by pure carbolic acid carefully applied on small cotton applicators, followed by neutralizing alcohol. Whichever method is used, and the second is preferable, the cavity is then tightly packed with $\frac{1}{2}$-inch iodoform gauze soaked in Churchill's iodine. A general or local anaesthetic is necessary. In the treatment of an abscess, a general anaesthetic is essential, both from the patient's point of view as well as from that of the surgeon. In simple cysts, or cysts with turbid contents, the patient may be allowed to go home on the following day. On the fourth day about one-third of the packing is removed, another third on the sixth day, and the remaining third on the eighth day. In badly infected cases the patient may have to be kept in hospital for a longer period, depending upon the amount of infiltration. The end-result is an invisible scar, without deformity, without any possibility of dyspareunia, and a shorter and painless convalescence.

Suburethral Cysts and Abscesses.

These cysts are of fairly common occurrence. They vary in size from an almond nut to that of a hen's egg. They originally communicate by a small aperture with the urethra, of which they are probably a derivation. This aperture may subsequently close. Some of the cysts enlarge during micturition, and can be emptied by pressure of the finger in the vagina. This connexion with the urethra is important to recognize. Without this knowledge, permanent surgical damage to the urethra may follow the

operation. Two such cases, in which the cysts had been dissected out, came under our observation post-operatively, with a permanent urethro-vaginal fistula and lack of continuity below and above the fistula, owing to the removal of part of the urethra during dissection. When a suburethral retention cyst becomes infected, an abscess of various degrees of chronicity, or acuteness, results. In these cases, dissection may be extremely difficult. But in addition the cysts lining may extend as high as the base of the bladder, and at the operation the sphincter visicae may be in danger of having its nerve or muscle divided. The necessary operation is extremely simple. It consists in cutting a fenestra from the vaginal anterior wall into the cyst cavity, and in placing a few isolated stitches to unite the vaginal mucosa with the cyst wall. A wick of gauze may be necessary in an acutely infected abscess, but nothing further is required in an ordinary cyst. In 2 weeks the cavity has shrunken so as to be unrecognizable. The primary communication with the urethra has already closed in the cyst or abscess. In cases of cysts filling only when urinating, fenestration is all that is required, since the fistulous opening closes spontaneously.

Perineal Cysts.

Perineal cysts are of many varieties, but most frequent among these are inclusion cysts, in parous women. These cysts are seldom larger than a marble, and are filled with a yellow semi-fluid substance of a sebaceous nature. They are usually found accidentally in performing a plastic operation on the vagina and perineum, or in an episiotomy at a subsequent labour. They are only of scientific interest. Occasionally, however, they become infected, and may assume large proportions, as two cases we saw of recent date, which had become as large as a hen's egg. The only treatment for such cases is to dissect out the sac and reconstruct the perineum.

Nabothian Cysts.

These are small retention cysts of the cervix, in which racemose columnar lined glands become occluded, and distended by secretory pressure. The contents is always of stringy mucus, and their dimensions vary from the size of peas to that of filberts. Only those near the external os are visible as pearly white or opalescent elevations on the portio. But three significant facts must be remembered: (1) Nabothian cysts do not cause symptoms; (2) the visible ones are but a fraction of a general cystic

state that extends throughout the cervical canal, and is most marked at the external and internal ora; (3) they are merely one expression of a diffuse cervical infection.

Nabothian cysts arise in one of two ways, either by a catarrhal mucosal disease causing blocking of the duct by a multiplication of its lining epithelium or, more commonly, by constriction of the ducts by a diffuse chronic cervical fibrosis, the sequence of an extremely chronic infection, chiefly of the interstitial tissues. In the former types there are leucorrhoea, catarrhal endocervicitis, and ectropion; in the latter, a large hard cervix, nodular, but frequently not presenting any sign of catarrhal or excessive secretory changes. In the first or catarrhal type, mild cauterization of the whole length of the cervical canal, by a dull red heat, so as to have prolonged contact, may effect a marked improvement, at least temporary, if the organic changes are not too great; or permanent, if the departure from the normal organic structure has not been marked. The cautery should be slight, as described in a previous article on the subject. In the second or interstitial type, cure of the condition is not to be hoped for. Deep cauterization of the cervical canal, with deep cautery incisions into the interstitial substance of the cervix, is as futile as it is destructive. Cauterization and evacuation of the visible cysts are but sops to one's conscience. It is but a pitiful display of ignorance of cervical pathology, and is as futile as grassing the edges of the Sahara to prevent sand storms.

This is so written to emphasize that Nabothian cysts are not restricted to the visible portio, but are an infection of the whole canal, of which the collection of cysts at the internal and external ora is but one unimportant manifestation of a disease of much graver significance, moreover, deep destructive cauterization, so commonly in vogue in Canada in office treatment, can only, added to the organic changes, frequently lead to haematometra and pyometra in women past the menopause, and to dystocia and Caesarean section in women who subsequently become pregnant.

Vaginal Cysts.

These are, for the most part, retention cysts of embryonic rests. They may vary in size from that of a pea to that of a Californian orange; may arise from any part of the vagina, but are chiefly confined to the upper two-thirds and, more especially, to the upper third. They are usually simple, but may be mul-

tiple, and when arising from vestigial remains of Gartner's duct, which is a permanent canal from the Fallopian tube to the vulva in some of the vertebrates, one may find a row of small cysts, extending up one, or both, walls of the vagina from the hymen to the fornices, and beyond. In the larger types the most prominent part of the cyst becomes thinned by internal fluid-pressure, and the contents can be seen through the wall.

The treatment of the simple cyst is the easiest of surgical procedures. Merely incise the cyst, cut out a window, appropriate in size to the size of the cyst, and leave it alone. In 2 weeks the cavity will have shrunken so that its lining has fused into a component part of the vaginal wall. As the vaginal wall is almost devoid of sensory nerves, these cysts, if easily accessible, can be treated without local or general anaesthesia.

Multilocular pseudomucinous cysts of the vagina are always due to a downward extension of a foetal rest, probably of ovarian or coelomic origin. These cysts are fortunately rare, but when encountered, can be the meanest type of growth to deal with satisfactorily. Their stringy contents at once denote their character. They are 100 per cent multilocular, and cannot be reached by the vaginal route. They frequently ramify throughout the interstitial tissues of the pelvis, undermining vital structures, and in one patient extended into the apertures of the sacrum, and through the great sacrosciatic notch. Again, fortunately, they are rare. The authors have encountered but 3 cases in many years, and in these the operation failed owing to the inadequacy of surgical and technical possibilities. The vaginal opening of this type of cyst may serve merely to permit a digital examination of the extent and accessibility of the new growth. This tumour has been described as a cyst, it is truly a cystoma. A cyst is merely a retention cavity; a cystoma, a new growth.

Fibroma of the Ovary: A Clinical Study.

BY

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FIBROMA of the ovary is a relatively common condition. Its frequency has been variously given in the literature. Hellman reports only 6 cases in 4,500 specimens collected over a period of 10 years. Loehlein, quoted by Clarke and Gabe, found 7 in 172 ovarian tumours. Frank[1] considers that fibromata form 2.25 per cent of ovarian tumours, and quotes Kelly as finding 5.9 per cent in 555 ovarian tumours, and Hoon[2] 3.5 per cent in 4,175 ovarian tumours.

The pathological aspect of ovarian fibromata has received attention, but the clinical features seem to have been given little consideration in the literature. A series of 30 cases has been collected from the records of St. Mary's Hospital, Manchester, dating from 1910 to 1937, together with a case on which the author operated at Withington Hospital, Manchester, and their symptoms have been studied in an endeavour to present the salient clinical features. In every case the specimen secured has been subjected to microscopical examination and proved to be a fibroma.

The particulars of the author's case are:

> Mrs. L.S., aged 35 years. Admitted to hospital on 20th May 1937. She had had 1 child 11 years ago; the confinement was followed by an attack of salpingitis. Two years ago she had amenorrhoea for 3 months. Menstruation then occurred at intervals of 2 to 3 weeks with a normal loss. She now loses for 3 days every 4 weeks. The patient has had 3 periods since 27th April 1937, each lasting 3 days with a normal loss. During menstruation she complained of pain in the left side, back, and left leg. There has been a gradual increase in size of the abdomen for 2 years. Bowels constipated. Micturition normal. Heart and lungs normal. Urine clear. There was resistance to palpation in the left iliac fossa; no mass palpable.
>
> On vaginal examination the uterus was anterior. A very hard, fixed mass could be felt continuous with, and inseparable from, the uterus, and extended up and to the left. The condition was diagnosed as a uterine fibroid.

Operation. The omentum completely shut off the pelvic cavity. On dividing it a hard craggy mass was found on the left side of the pelvis adherent to the uterus and rectum and burrowing into the broad ligament. Adhesions were freed, the mass was dissected out of the broad ligament and found to be a solid ovarian tumour. The left Fallopian tube and ovary were removed.

Pathology. An ovarian fibroma weighing 4¾ ounces. There was not any evidence of sarcoma.

As a check on this case a series of 21 cases was collected from the literature. The St. Mary's cases reported in this paper will be referred to as Series I, and the collected cases as Series II.

ANALYSIS OF CASES.

The age distribution is as follows:

	Series I	Series II
Under 20	0	1
20 to 30	2	5
30 to 40	2	4
40 to 50	9	5
50 to 60	10	5
60 to 70	8	0

It will be seen that the condition is much more common over 40 in Series I. In Series II there was an earlier onset than in the other group.

The question of parity. The majority of the patients of Series I were parous. Twenty-two of them were multiparae and 8 were nulliparae; of these nulliparae only 2 were married. The fertility of 1 patient was not recorded. In Series II there were 16 patients in whom the data were not recorded, 4 multiparae and 1 nullipara. These findings are contrary to those of Clarke and Gabe who state that the majority occur in single women.

The analysis of the menstrual histories is enlightening. In Series I from the age distributions it is obvious that many of the women will have passed the menopause, 19 out of 31. Of these 4 had a slight loss *per vaginam.* This is interesting as all the tumours were reported on microscopical evidence to be fibromata, and Caylor and Masson,[3] who reported 4 cases of fibroma undergoing fibro-sarcomatous degeneration with a sanious discharge, comment on the fact that this symptom is suggestive of malignancy.

Of the 12 women who were menstruating, only 2 gave normal

menstrual histories. The other 10 all complained of some disturbance. Change in rhythm occurred in 2 patients, and in both the periods became more frequent although in one this change was preceded by 3 months' amenorrhoea. Five patients complained of dsymenorrhoea and 7 of menorrhagia. It will be seen that in some patients two changes occurred, dysmenorrhoea and menorrhagia together being most common. In Series II a report of the menstrual history was absent in 5 cases. Three patients had passed the menopause and of these one had a sanious discharge. Dysmenorrhoea occurred in 1 patient, menorrhagia in 5 and change of rhythm in 4. There were no cases of amenorrhoea and only three patients had unaffected menstrual histories.

This finding is quite contrary to the statement of Titus that the menstrual history is unaffected except for dysmenorrhoea when some ovarian tissue remains in the affected ovary. Hoon, basing his statement on a series of 55 cases, considers that menstruation is seldom affected, and Doran records similar findings.

Symptoms.

The most common symptom was pain, which occurred in 20 patients in Series I, a mild bearing-down sensation was experienced by 9 patients. In Series II pain occurred in 9 patients. The varieties of pain were:

	Series I	Series II
Pelvic pain	6	3
Pain in the side	10	4
Abdominal pain	9	1
Pain in the leg and thigh	2	0
Pain of acute torsion ...	2	1
Pain in the back	6	1

Abdominal swelling was also a prominent complaint. In Series I it was present in 17 cases, but a lump was noticed by the patients in only 8 cases. This symptom is difficult to assess in Series II, but will be referred to under physical examination.

Pressure symptoms were also a prominent feature of the condition. In Series I 18 patients presented some form of these symptoms. Ten patients were constipated and 1 complained of dyspnoea due to elevation of the diaphragm. Thirteen patients complained of some disturbance of micturition. In 12 there was

frequency often definitely stated to be diurnal frequency which was relieved by rest in bed or aggravated by exercise, which suggests that the tumour was pressing on the bladder. Only 2 had dysuria and 1 had symptoms of retention. The tumours were, therefore, situated high in the pelvis and did not press on the neck of the bladder.

In Series II, on the other hand, pressure symptoms occurred in 12 patients. In 3 of these the symptoms were due to ascites, in 1 case definite pressure under the ribs was the complaint, constipation occurred in 3 cases, dysuria in 4 and frequency of micturition in 1.

Duration of Symptoms.

This was difficult to assess in Series II. In Series I the symptoms had been present for under a year in the majority of cases. In 7 cases symptoms were present for 6 months. Ten patients had symptoms present for 12 months, 2 for 2 years, 3 for 3 years, 3 for 4 years, 1 for 5 years, 1 for 8 years, 1 for 9 years, and 1 for over 10 years. In 2 cases the duration of symptoms was not recorded.

Physical Findings.

In Series I, on abdominal examination 24 patients were found to have definite tumours. These were described as being solid in 16 cases, cystic in 5 cases, tender in 5 cases, mobile in 13 cases, and fixed in 2 cases. Ascites was found in 4 cases.

In Series II, 11 cases presented an abdominal tumour and 6 ascites, and of these 3 patients had marked dyspnoea and had had paracentesis, both thoracic and abdominal, performed several times.

Vaginal Examination.

In Series I a uterine tumour was diagnosed in 7 cases. A tumour of the appendage was found in 11. This was described as attached to the uterus in 5, and mobile in 4. Vaginal examination was doubtful in 3 cases, negative in 4, and not recorded in 3.

In Series II the vaginal examination was recorded in 6 cases, in 3 it was not helpful, and in the other 3 the tumour was hard, mobile, and distinct from the uterus.

Operative Findings and Procedure.

Bilateral tumours are uncommon. One case occurred out of 31 cases in Series I, and 1 in 21 cases in Series II. Left-sided

tumours were more usual; there were 19 cases in Series I as opposed to 11 right-sided tumours, while in Series II the proportion of left to right was 5 to 4. Definite mention and description of a pedicle was made 4 times in Series I and 11 times in Series II. Torsion was stated to have occurred 4 times in both series. Ascites was present in 4 patients in Series I and in 6 in Series II. Adhesions were described 4 times in Series I and 6 times in Series II. Only 1 case of abscess of the tumour occurred, the case being in Series I. The diagnosis from malignant disease may be very difficult at the time of operation—2 cases in Series I and 1 case in Series II needed pathological and microscopical examination to prove that the tumour was innocent.

Oöphorectomy was performed 15 times in Series I and 14 times in Series II. The Fallopian tube was removed with the tumour 7 times in Series I and 4 times in Series II. Supravaginal hysterectomy and double salpingo-oöphorectomy was the procedure in 6 cases in Series I and in 1 case in Series II, while panhysterectomy was performed 3 times in Series I and not at all in Series II.

In Series I the pathologist's report was fibroma in every instance. Thirteen of the tumours showed degeneration; 6 were cystic, and 7 hyaline in character. Haemorrhage had occurred into the tumour in 1 case.

In Series II the pathologist's report was again fibroma in every case. Eight cases showed degeneration, 2 myxomatous, 1 hyaline, 5 cystic, and 5 necrotic. Calcification occurred in 1 and haemorrhage into the tumour occurred in 3. Inflammatory changes were present in 1 case. Several cases obviously, therefore, showed more than one type of degeneration.

An endeavour was made to correlate the pain experienced with the operative findings. The patient experienced pain when degenerative changes had occurred in the tumour in 6 cases in Series I and in 5 cases in Series II. Haemorrhage into the tumour and pain experienced by the patient occurred once in each series. Torsion and pain were present in 4 patients in Series I and 1 case in Series II. Adhesions and pain and abscess of the tumour and pain occurred only once in Series I and not at all in Series II. Inflammatory changes and pain were noted in 1 case in Series II and not at all in Series I. In Series II there were 2 cases in which the pedicle was twisted and the patients did not experience any pain. In 2 cases adhesions and degeneration were present together.

In 13 patients out of 20 experiencing pain in the first series

changes in the tumour may have been responsible. In Series II in 8 of the 9 patients who experienced pain there were some changes in the tumour. It is difficult to assess the values of these findings but there seems to be a larger number of uncomplicated cases in which the patient suffered pain than would be so in a similar series of uterine fibroids.

Differential Diagnosis.

Diagnosis may be difficult even at the operation when the condition may be thought to be malignant, so that the tumour should always be examined microscopically.

Uterine fibroids and malignant tumours of the ovary are probably the most frequent diagnoses. A broad ligament cyst or tumour may also be diagnosed.

When there is gross ascites, malignant disease, tuberculous peritonitis, and other causes must be eliminated. When advanced cystic degeneration is present the tumour may be diagnosed as an ovarian cyst.

Finally, it may be said that in women in the reproductive period of life a fibroma of the ovary may occur with pregnancy. Such a case was reported by Danforth.[4]

Conclusions.

1. Fibroma of the ovary is a rare condition; only 30 cases could be collected from the records of St. Mary's Hospital, Manchester, covering the period 1910 to 1937.

2. The condition is commonest at the menopause and in this series multiparae were chiefly affected.

3. In women during the reproductive phase of life menstrual disturbances occur as a rule. The chief disorder is menorrhagia and next in frequency is dysmenorrhoea. Changes in rhythm and amenorrhoea may also occur.

4. A sanious discharge may occur after the menopause.

5. Pain is a common symptom and may be localized in the pelvis, side, abdomen, leg, and back. The pain may be acute, due to torsion. The most usual site is in the side.

6. Abdominal swelling is also a common feature. The swelling may be due to the presence of a palpable tumour or to ascites.

7. Pressure symptoms occur frequently. Vesical symptoms, especially frequency, and constipation are prominent features.

8. In the majority of cases symptoms have lasted for under a year.

9. The tumour may be fixed to the uterus, may appear to be part of the uterus, or may be entirely separate from the uterus.

10. Left-sided tumours are commoner than right, and bilateral tumours are rare, only one occurring in each series of cases.

11. It is difficult to assess the factor played in the production of pain by degenerative changes in the tumour, but it seems to be less than is the case in uterine fibroids.

I desire to thank Dr. Gamble and Dr. Newton for permission to report and operate on the case from Withington Hospital, Manchester, and Dr. G. D. Dawson for reporting on the microscopical features. I also wish to thank all the members of the Honorary Staff of St. Mary's Hospital, Manchester, for permission to use their cases as a basis for this report.

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Radiograms taken during Labour from its onset until the Head is Born, indicating the Position of the Anterior and Posterior Shoulders

BY

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It appears when the skiagrams indicating the varying positions of the anterior and posterior shoulders during labour as it progresses, sent for publication and published with the original article,* the skiagrams of the lateral views of the left occipito-anterior and the right occipito-posterior positions miscarried, and were not printed.

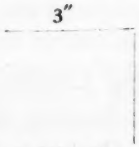
These lateral views are important, as they show how far the head had sunk into the cavity when it was engaged and how the attitude of the back and head varied in both positions. The posterior one is interesting, as it exhibits quite definitely the extension of the back as being opposed to the mother's convex spine, and the consequent deficient flexion of the head. The spine is almost straight in the back, but, on looking at the neck, it appears hyperextended, thus inducing slight extension of the head and bringing the occipito-frontal diameter across the pelvis before the onset of labour, and not the suboccipito-frontal as is usual in the anterior position.

The case on which the skiagram was taken was followed during labour and was confined naturally in the reduced right occipito-anterior position. The notes are as follows:

Sakhubai Ganpat, age 20 years, 1-para, registered number 1930, X-ray number 130 of 36. Position vertex III, head more than half engaged, the

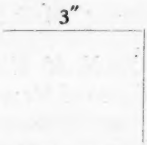
* See pages 726–728.

measurements of the anterior shoulder being 2¾ inches high above the symphysis pubis and 3 inches away from the middle line:



Pelvic diameters, I.S. 8½ inches, I.C. 9¼ inches, Ext. Conj. 7 inches. Admitted with labour pains on 12th September 1936 at 7.45 p.m., with weak labour pains from 4 p.m.

Measurements of the anterior shoulder at the time of admission were:



First stage: from 4 p.m. to 12.50 a.m. (8 hours 50 minutes); pains weak.

Second stage: from 12.50 a.m. to 2 p.m. (1 hour 10 minutes); contractions strong.

Third stage: from 2 a.m. to 2.10 a.m. (10 minutes); placenta and membranes intact (delivery as the second position). Baby: female; perineal tear, one stitch).

The radiogram of this case representing the side view in the right occipito-posterior position taken before the onset of labour shows clearly the altered attitude of the back and neck and deficient flexion of the head, but in the course of labour the flexion of the head became complete, overcoming the hyperextension of the cervical spine, and the case ended in occipito-anterior delivery.

LATERAL VIEW. VERTEX I.

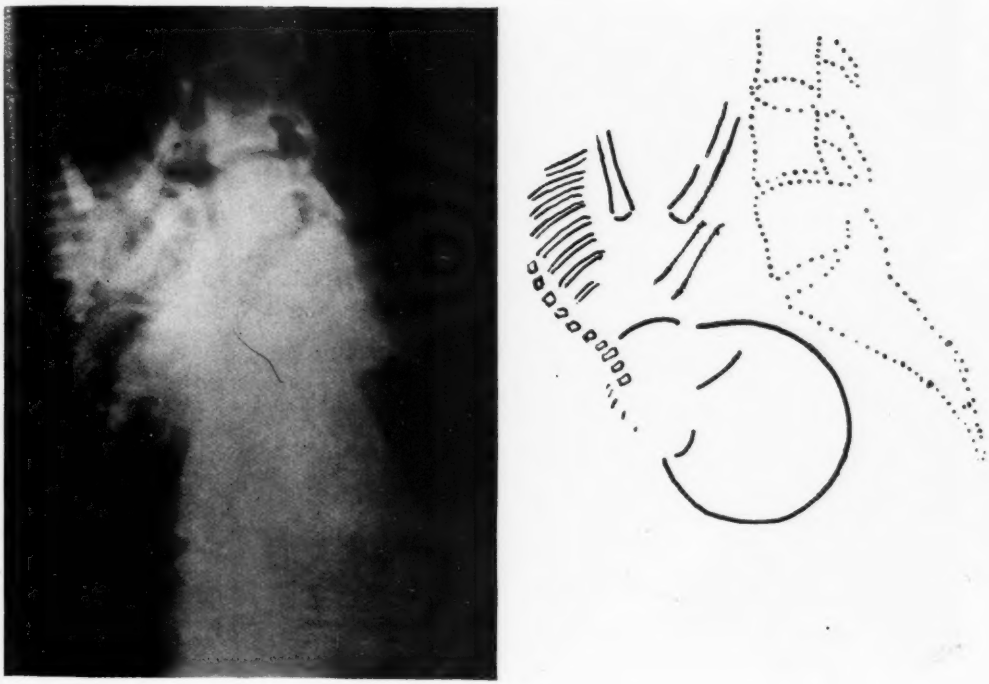


FIG. 1. Vertex I. Back: To the front away from the mother's spine. Bent forward. Head: Occiput forwards, face behind; diameter of engagement, sub-occipito-frontal.

LATERAL VIEW. VERTEX III.

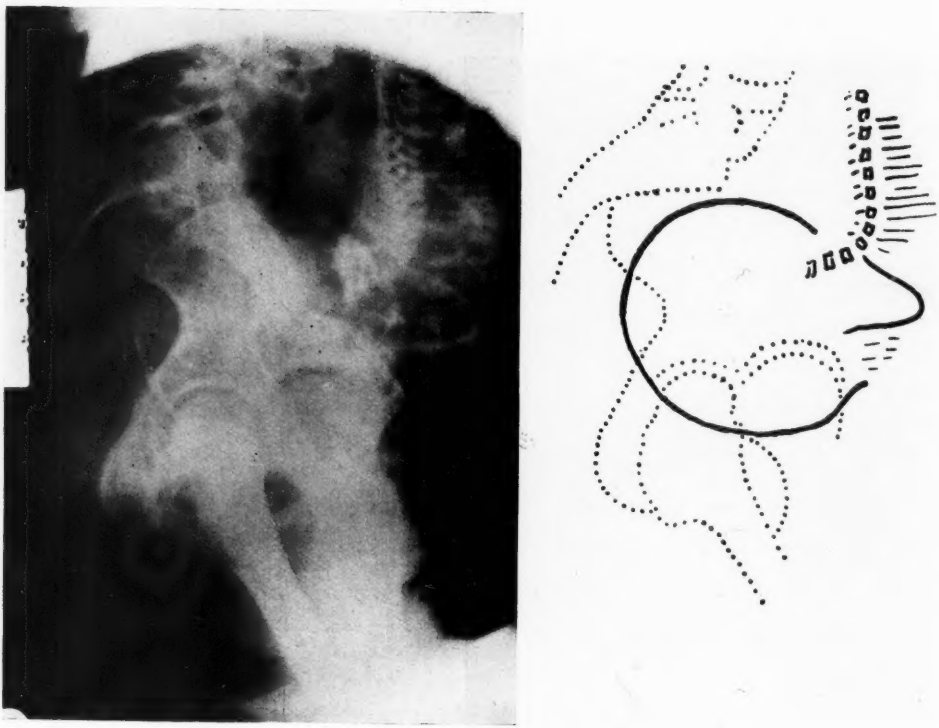


FIG. 2. Vertex III. Back, in front of the spine, straight, hyperextended in the neck. Head: occiput behind, deficient flexion; diameter of engagement, occipito-frontal.

BRITISH COLLEGE OF OBSTETRICIANS AND GYNAECOLOGISTS

At the autumn meeting of the Council held on Friday, October 22nd, with the President, Sir Ewen Maclean in the chair, Dr. George Gray Ward, of New York, was admitted to the Honorary Fellowship.

The following were admitted to the Membership:

Sudhir Chandra Bose	India
Marjorie Ruth Elizabeth Boyd	London
Francis Joseph Burke	Liverpool
Hugh Callagher	Australia
Isabella Cameron	London
Phillip Joseph Ganner	Birmingham
Hartley Frederick Patterson Grafton ...	Canada
Charles John Kenneth Hamilton	Liverpool
Maurice Roberts Wilson Hart	India
John Howkins	London
John Godfrey Hastings Ince	London
James Walter Johnstone	Australia
Laetitia Luzia Cornelia de Menezies	India
George Albert Simpson	Canada
Arnold Bernard Stenhouse	London
Margaret Venters	Glasgow
Robert James Wotherspoon	Glasgow

The following were admitted to the Membership (*in absentia*):

Eric Bailache	Australia
Jagadispada Dutt	India
Edith Ghosh	India
Mary John	India
Mary Poonen Lukose	India
Anna Pollock Martin	India
Dhiremba Nath Mitra	India
Olive Monahan	India
Una Frances Marie Morton	India
Baman Das Mukherjee	India
Herbert Edward Murray	India
Anath Nath Palit	India
Nilkanth Anant Purandare	India
Akhilanath Sarkar	India

Manindranath Sarkar	India
Bawa Harkishan Singh	India
Padmanur Ventkatagiri	India

Dr. T. F. Corkill, of Wellington, New Zealand, was appointed a member of the New Zealand Reference Committee.

The following candidates have been awarded the Diploma of the College (D.C.O.G.) after examination:

James Baxter	Arbroath
Thomas Arthur Best	Harrogate
Beatrice Aileen Blake	London
Eleanor Dorothea Blunt	Hastings
Stanley Gordon Brook	London
William John Candlish	Nottingham
Ralph Gordon Cooke	Derby
Lancelot Harry Copping	Rotherham
Jack Cooper Cuthbert	London
Charles Stephen France	Wigan
Thomas Neville Hart	Farnworth
John Anthony Jasper Hammond	Rudgwick
Adrian Hill	London
Henry Brian Jennings	Ormskirk
Arthur Norman Jones	London
Godu Limaye	India
Ibrahim Magdi	Egypt
George Bernard Marsden	Liverpool
Horace Gordon Page	Guildford
James Stainton Price	Birmingham
John Russell Ritchie	New Zealand
John Marshall Ross	Ashton-under-Lyne
Mohamed Salleh	India
Kingsley Ward Stroude	Wallasey
Jack Reford Taylor	Glasgow
Dorothy C. R. Vethavarnam	India
Saraswati Dharamdas Vora	India
John Monson Watt	Rotherham

HOSPITAL REPORTS

ROTUNDA HOSPITAL, DUBLIN.

REPORT FOR THE YEAR 1ST NOVEMBER, 1935, TO 31ST OCTOBER, 1936.

"YE who listen with credulity to the whispers of fancy and pursue with eagerness the phantoms of hope", who buy ticket after ticket for the Irish Sweepstake—read for your consolation the latest report of the Rotunda Hospital. There you will learn how much your speculative generosity has benefited this Institution. One of its chief acquisitions is a new Out-patient Department which "was opened on the 5th May and resulted in a 30 per cent increase in the number of patients during the following six months." An architect's plan and several excellent photographs are reproduced and should be helpful to those who contemplate building a similar unit. But, as almost always happens after a new department has been put into use, a few minor defects have become apparent, and I know that Professor Davidson will be delighted to point out to anyone interested some detailed improvements which experience has suggested to him. He has told me so personally.

"If the deliveries in the hospital and on the district are added it will be seen that the Rotunda was responsible for 4,791 confinements, constituting a record in its history." Nevertheless, the results remain extremely good. There were only 2 maternal deaths (0.48 per cent) on the district, and 21 (0.73 per cent) in the hospital. The death-rate in the Intern Department would have been even lower but for two unfortunate circumstances.

In the first place, there were several very severe cases among the 11 eclamptic patients admitted during the year, and no fewer than 5 of them died. As everyone knows, this is a most unusual occurrence in the Rotunda, where for over 30 years the death-rate from this complication has averaged about 10 per cent.

The second disaster was "a serious outbreak of haemolytic streptococcal sepsis," which "occurred in the months of March and April preceded by a smaller one during January and February. There were 14 cases with 4 deaths, a mortality of 28 per cent. Extensive building and alterations were taking place in the hospital and general cleanliness was difficult to preserve." No doubt this handicap predisposed to such an epidemic, but a much more definite factor was discovered. This series "coincided with a severe outbreak of streptococcal throats both in the hospital and the city", and Professor Davidson demonstrates very clearly that droplet infection was the initial cause in the majority of cases. He describes the epidemic in detail, tracing it stage by stage from start to finish, and he must be congratulated on the lucidity with which he sets the facts before us. He also deserves great credit for his efficient management of a very difficult situation. Every reader will share his regret that not one of the drugs of the prontosil group was available until the series was just ending. And, so much are we

impressed by his vivid account, that we can readily overlook his occasional lapses into colloquial hospital jargon.

The Master discusses the outbreak and the lessons it taught. Very rightly he emphasizes the importance of periodic examination of the flora of the naso-pharynx of those who engage in obstetrics. He has also instituted the use of masks as a routine in his hospital—"up to this time masks had not been used in the Maternity Department, but this epidemic and the knowledge of its mode of origin decided a change of policy." There is not, of course, any evangelist so fervid as a converted sinner, and the Master continues, "It is also felt that [the danger of droplet infection] is not sufficiently stressed in the Rules of the Central Midwives' Board."

Naturally, so much space is occupied in the consideration of this epidemic that the rest of the report is apt to receive less attention than it deserves. The reader should set himself to avoid this error, for the remaining sections are instructive. Especially interesting are the excellent data regarding persistent occipito-posterior positions, breech extractions, and delivery with the forceps. On the other hand, the results obtained in cases of placenta praevia are not so satisfactory—the foetal mortality is too high. This is to be attributed chiefly to the treatment employed. Caesarean section was not performed in any of the 32 cases. The Master admits that it might with advantage have been done in two instances, but he considers that the other 30 cases were unsuitable for it by reason of prematurity or on account of the "maternal condition." The detailed table does not explicitly state the mother's condition, but from the fact that blood transfusion was given to only 6 of the patients we may infer that on the whole it was not too bad. Again, the degree of prematurity was not extreme in all cases—in fact the pregnancy had reached the thirty-fourth week in 22 of them.

There are many other points to which one would like to refer, but if one did so this review would be almost as long as the report itself. Better that every obstetrician should study the original and form his own opinions. The time will be well spent

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THE COOMBE LYING-IN HOSPITAL, DUBLIN.

Clinical Report for the Year 1936.

"During the year 1,312 patients were admitted to the Maternity Department, and of this number 1,089 were delivered in the hospital. This represents a decrease of 99 deliveries on last year, and is largely accounted for by "the temporary closure of wards for disinfection and painting." The disinfection was rendered necessary by the unfortunate fact that this hospital, like the Rotunda, was involved in the epidemic of streptococcal infection which spread through Dublin during the first half of the year.

The Master does not describe the outbreak quite so fully as does his colleague in the Rotunda, but it will be seen from the following extract that the two epidemics were in many respects similar, and that in each case the medical attendants are fully convinced of the origin of the infection and of the importance of the use of adequate masks in obstetric practice.

"The B.M.A. morbidity rate was 5.4 per cent, that is, 42 cases plus 17 deaths.

"This morbidity rate is the highest which the hospital has had for several years and is due to the fact that Dublin was swept by a wave of streptococcal infections of all kinds during the spring and early summer of 1936."

"Three deaths from puerperal sepsis occurred in February and only 2 other cases of morbidity, both of a mild nature, occurred during that month. One death occurred at the end of March and 1 in the middle of April. Both these patients had been discharged from hospital and re-admitted 5 days later with general peritonitis of sudden onset. Full notes will be found in the mortality table. Although there were 11 other morbid cases during the months of March and April, none of them were serious and a growth of streptococci was not obtained either from the blood or uterine cultures.

"On the other hand, an outbreak of puerperal sepsis in June gave rise to 6 very severe infections but all the patients recovered. This was a definite epidemic, whereas the other cases appeared to be sporadic. Immediately prior to this outbreak, a patient developed a streptococcal sore throat the day after her delivery, and about this time, 1 nurse was down with scarlet fever, 3 with septic throats, and 1 with an acute antrum. One of the assistants and 14 of the nursing staff gave positive cultures of haemolytic streptococci from throat swabs.

"It seems certain that the type of mask worn in the early part of the year was inefficient and that insufficient attention was paid to the problem of the carrier.

"Since introducing a new type of mask and a more rigorous control of possible carriers, there has been a gratifying diminution of morbidity, but this was coincident with the decrease of streptococcal infections in general in the city.

"Prontosil was used in the treatment of the patients in the June outbreak, and was adopted as part of the routine treatment of puerperal sepsis during the remainder of the year."

The report as a whole has been carefully prepared, but as the number of complicated cases is small, little can be said regarding the abnormalities. It is all the more surprising, therefore, that tables have been compiled showing the main details of several complications which were seldom encountered, while details are not given regarding the largest group of all, viz., the cases of albuminuria. There were 21 cases of eclampsism and 128 cases of albuminuria of a milder nature.

During the greater part of the year the treatment of pre-eclamptic toxaemia consisted in the restriction of fluid, as suggested by Fay and Arnold, while feeding the patient on a fairly liberal diet. In mild cases, and in severe cases showing improvement under treatment, protein was included. Calcium and vitamin preparations were also given. It would be, as yet, premature to estimate the value of this treatment. That is true, of course, but the majority of obstetricians will be disappointed that particulars have been withheld.

HOSPITAL REPORTS

NATIONAL MATERNITY HOSPITAL, DUBLIN.

MEDICAL AND CLINICAL REPORT FOR THE YEAR 1936.

"THE attendance at all departments of the hospital again showed an increase over last year's record figure," and reconstruction naturally led to inconvenience, delay, and congestion. But "the final section of the hospital is now nearing completion, and we hope to have completely passed through this difficult period of nearly 6 years rebuilding, with its accompanying noise, dirt, dust, and overcrowding, before the end of 1937." This is obviously spoken from the heart, and it carries conviction. One can almost feel the grit between one's teeth!

In spite of the difficulties of accommodation, the staff has managed to avoid the attendant dangers. The mortality-rate is very low (0.53 per cent) and the incidence of morbidity is only 3.8 per cent. These results merit sincere congratulation. It is explained in the report that "during recent years a great deal of attention has been given to the question of antiseptics suitable for obstetrics and gynaecology. Dettol was first introduced into this hospital 4 years ago. It was found so satisfactory that its use has been gradually extended. During the year 1936 all other antiseptics were abolished in its favour." But figures are not given showing this superiority. It is not stated whether masks are worn or not, nor is the question of rectal examination discussed. In view of the results attained it would be of general interest to have details on these points, and they might be dealt with in next year's report.

Most obstetricians will agree with the author when he writes that "one of the complications which gives rise to considerable trouble and anxiety and is responsible for a large number of our morbid cases" is uterine inertia. Twenty-eight of the more severe cases are described in Table X. Only 2 of these patients delivered themselves spontaneously, 1 was delivered by Willet's forceps, 1 by Caesarean section, 2 by breech extraction, and the remainder by the forceps. Manual removal of the placenta was necessary on 2 occasions, and 2 other patients had a severe post-partum haemorrhage.

There is nothing of special note in the rest of the report, but many readers would welcome a detailed table of the cases of albuminuria. In the year under review there were 334 patients with definite albuminuria, and it seems a pity that almost nothing is said regarding this large group.

GUY'S HOSPITAL, LONDON.

CLINICAL REPORT FOR THE MATERNITY DEPARTMENT FOR THE YEAR 1936.

This report differs from all others in the method of classification. A distinction is not made between "booked" and "unbooked" cases, or between patients delivered in their own homes and those confined in the hospital. For this reason it is not possible for anyone studying a particular problem to augment his data from the figures presented. But the departure is made deliberately and the classification adopted supplies information of

an unusual kind. Whether this is of any real value is a matter of opinion. There are only a few points to which it is necessary to refer.

One commendable feature is the subdivision of breech deliveries into the "uncomplicated" and "complicated" groups suggested by Gibberd. It would, I think, be a good plan for all obstetric registrars to adopt this method.

Another fact which at once arrests attention is the large number of cases of post-partum haemorrhage. There were 108 instances of this complication in just over 1,000 patients. Now the results in this hospital are otherwise so good that one cannot believe that approximately 10 per cent of patients had a post-partum haemorrhage in the ordinary sense of the term. Indeed it is evident from the report itself that a very exacting standard has been set and that in the majority of cases the bleeding was too slight to have any clinical significance. Every patient who, after the birth of the child, loses "one pint or more, approximately," is placed in this category. But none of the patients required blood transfusion and on only 2 occasions was infusion of gum-saline necessary.

During the year 30 cases of cardiac disease were treated. None of them died, a result which implies great care and judgment on the part of the attendants. There were, however, very few serious cases. All of the pregnancies advanced to the thirty-sixth week, and compensation is recorded as "good" in 25 cases and "fair" in the remainder. Caesarean section was not performed in any case for the cardiac condition as such.

Other complications were, of course, encountered, but the numbers are too small to admit of comment. It would be very unfair, however, to omit the final sentence of the report, viz., "there were no maternal deaths."

WILLESDEN MATERNITY HOSPITAL.

Clinical Report of the First 3,000 Cases.

It is rather curious that mere chance should have led me to take up this report immediately after I had written my review of the work at Guy's Hospital, for two matters I have just mentioned crop up here again.

Under the heading of Post-partum Haemorrhage we read: "No attempt is made to work out the frequency of post-partum haemorrhage owing to the practical difficulty of measuring the amount of blood lost. The amount of blood measured fails so frequently to present an accurate picture of the clinical condition of the patient and the fluid collected by midwives proved so frequently to be diluted with liquor amnii, urine or lotion that any attempt to make a numerical estimate of the frequency of post-partum haemorrhage would be misleading." Well, that is one way out of the difficulty! But it would seem that such a statement goes too far in the one direction, while the custom at Guy's Hospital goes too far in the other. It is true that the volume of the fluid which can be collected and measured should not be made the basis of assessment. Rather one would suggest that for all practical purposes a case should be regarded as one of post-partum haemorrhage when the loss affects the patient's condition or when the bleeding is of such a nature as to need special treatment for its arrest.

The second point is the classification of breech cases. In this report Gibberd's grouping is used. In 61 uncomplicated cases there were only 2 stillborn children and 1 of these was macerated, whereas in the 10 complicated cases there were 7 stillborn infants 1 of which was macerated. Even when we add 2 neonatal deaths to the fatalities of the first group the results remain extraordinarily good.

Having thus plunged into the middle of the report it might be well to go back to the beginning where it is pointed out that the period covered by the record extends from February 19th, 1931, to February 5th, 1936. Only 61 of the patients were admitted as emergencies—the rest were booked cases. Not only so, but the routine practice is to admit patients on the first suggestion of abnormality since their homes and the antenatal clinics are at some distance from the hospital. This is undoubtedly a wise policy, and in all probability it has a definite bearing on the excellence of the results. The overall maternal mortality was 2.33 per 1,000, and in the booked cases 1.02 per 1,000. It could scarcely have been lower.

From what has been said it will be realized that this report cannot deal at any length with the grave complications of obstetrics. There were only 14 cases of placenta praevia, 9 of accidental haemorrhage, and 2 of eclampsia. Nevertheless, there were 28 cases of cardiac disease. These, we are told, were treated in co-operation with a cardiologist, and it is of interest to observe the method of delivery selected. Caesarean section was performed in 13 instances, 1 patient was delivered by the forceps, while 24 cases terminated by spontaneous expulsion (1 after induction of labour). One of the mothers died, 1 foetus was macerated, and 1 child died. The patient who succumbed suffered from aortic regurgitation, she had a severe degree of decompensation, and was in hospital for 21 days before labour was induced.

It seems to the reviewer that extraction by the forceps was found necessary in rather a high proportion of cases considering the relatively uncomplicated character of the majority of the cases in this hospital. The incidence of the operation was 5 per cent for all cases and 4.86 per cent for the booked cases. By far the commonest indications were uterine inertia, maternal distress, and a delayed second stage, but it is somewhat surprising to learn that in 10 cases the second stage had lasted less than 1 hour. It is easy to criticize, and there may have been every justification for haste in these particular instances.

One final comment—on page 22 there is a table in which 4 columns are left entirely blank. Would it not be better to omit the headings which are not utilized and so simplify the table and make it more easily read?

THE NOWROSJEE WADIA MATERNITY HOSPITAL, BOMBAY.

Report for the Year 1936.

One would like to do justice to this remarkable report but I do not find it easy. The growth and present size of the hospital are astonishing. During 16 months in 1922 to 1923 there were only 363 admissions, now the patients

are like the sands of the seashore for number. In 1936 no fewer than 6,369 women were treated in the wards, 4,728 were delivered, 9,953 new cases presented themselves at the Antenatal Clinic at which the total number of patients attending was 19,379. During the year over 3,200 cases were booked, and of these 1,890 were confined in the hospital. Many of the cases were abnormal and numerous complications were encountered that one does not have to contend with here. But the prevalence of tropical diseases does not wholly explain the exacting demands made upon the pathological department. A considerable number of special investigations are being carried out, and these, combined with the routine work, necessitated 3,050 laboratory examinations in the course of the year.

Some idea of the nature and extent of these studies may be obtained from the following extract from the report.

"The severity of anaemia among expectant mothers and women in general have (!) already been prominently pointed out by Dr. Miss Balfour and her colleagues during the last so many years of her research. The fact is corroborated by the high maternal mortality at the three large maternity hospitals in Bombay and by several leading obstetricians in this city. The equally high infant mortality both intra-uterine and post-natal may possibly be due to the same causes of anaemia in the mother. Malnutrition of expectant mothers has been suggested by several workers as one of the causes of anaemia. An enquiry, has therefore, been instituted in order to obtain data regarding the quality and quantity of food taken by expectant mothers who visit the Antenatal Clinics at the Nowrosjee Wadia Maternity Hospital and the Bombay Presidency Infant Welfare Society's Centres.

"Dr. V. S. Dastur, L.M.S., L.M. (Rot.), and Mrs. Thakur, M.A. (Sociology), have offered their honorary services to make the necessary field investigations at the Nowrosjee Wadia Maternity Hospital, Parel, and at the Nagpada Centre, respectively.

"The enquiry was commenced in June 1936, and so far data of 600 families have been obtained. Considering the difficult nature of the enquiry and the intricacy of calculations the enquiry is likely to occupy another year.

"The results so far show that the diet is poor both in quantity and quality, and is haphazard as regards both, as much of it depends on the wages earned by the husband and the wife. The vegetarian diet is poorer still in proteins and fats of animal origin. Ignorance as regards proper diet, the difficulty of obtaining it at proper times, and absence of variety appear to be contributory causes of malnutrition. Absence of proper milk supply to the family leads to prolonged lactation and diminishing vitality of the mother. The amount spent at present on food is surprisingly low and varies between Rs. 3 to Rs. 7 per mensem per person. Dr. K. S. Mhaskar, M.A., M.D., Hon. Secretary of the Bombay Presidency Infant Welfare Society, is co-operating in this enquiry and I offer him my grateful thanks for his kindness in guiding the research, which I am sure will serve as a valuable document for this city."

It is gratifying to know that the greatest possible use is being made of the hospital as a training school for nurses, students, and postgraduates. The methods employed are in some respects in advance of our own, and I quote the appropriate paragraphs for their general interest.

"During the year under report 52 final year students from the Seth Gordhandas Sunderdas Medical College conducted 1,040 cases, while 94 Final year students from the Grant Medical College conducted 1,069 cases.

"In addition to this 22 students from the Medical School, Hyderabad, Sind, conducted 132 cases. As usual the students from the Seth Gordhandas Sunderdas Medical College were detailed for one term at this hospital. They were given intensive training in the various wards and the antenatal department during the period. Similar facilities were given to students from the Grant Medical College.

"As mentioned in my last report, a fresh batch of Demonstrators was appointed to do alternate day and night duty on 8 hours' shift; this arrangement, I am glad to say, ensures adequate supervision of the students conducting labour cases, by one of the qualified medical staff of the hospital, as required by the University. These Demonstrators guide the students in conducting delivery and practising abdominal palpation; after confinement they give demonstrations on abnormal cases which have been delivered and also on patients having had artificial interference. This stimulates practical work among students; affords adequate facilities and help to them in the labour wards and ensures careful supervision of all the women confined. The Demonstrators, as a rule, are recruited from among those who have already held the appointment of Resident Accoucheur at this hospital."

Despite the frequent occurrence of all the obstetric difficulties we know in this country and several we never see, and in the face of social and economic problems far more serious than our own, the results obtained in this hospital will bear comparison with those in our chief institutions at home. They are worth quoting.

"*Maternal mortality*. Out of 6,369 admissions during the year there were 98 maternal deaths. The mortality-rate for all admissions is 1.45 per cent: of these 19 were admitted in a moribund condition and died within 24 hours; 19 patients were admitted after confinement at home mostly in a septic condition and died; only 9 deaths were among the booked cases, none of these was due to puerperal septicaemia; there were 51 deaths from among the emergency cases, of these only 4 deaths were due to puerperal septicaemia.

"*Causes of maternal deaths*. Anaemia 28, accidental haemorrhage 2, acute yellow atrophy 4, acute oedema of lungs 2, cerebral malaria 2, diarrhoea and dysentery 7, eclampsia 5, enteric fever 1, hemiplegia 1, meningitis 1, myocardial failure 2, obstetric shock 4, peritonitis 3, placenta praevia 3, pneumonia 6, post-partum haemorrhage 1, puerperal insanity 1, pulmonary infraction 1, pyelitis 1, rupture of uterus 3, rupture of the vault of vagina 1, septicaemia 11, traumatic haemorrhage 1, tuberculosis (pulmonary) 3, tuberculosis (other than pulmonary) 3, tetanus 1; total, 98."

Sixteen pages are devoted to a short account of the fatal cases. The essential details are so well presented that it seems overcritical to point out that a few printer's errors have escaped correction—for example, "Von Denbegh's Test," and "Ascitis".

Thereafter come 30 pages of tables giving very full details of the individual complications and operations. They are all excellent, but the one relating to the eclamptic patients is specially good.

It is not proposed to discuss the results of the methods of treatment

adopted in the different emergencies. Enough has been said to indicate the interest and importance of this report and the high standard of work done in the hospital from which it comes. One hopes that the report is very widely circulated and that those who receive it will read it carefully. It will, among other effects, produce a feeling of humility.

GOVERNMENT HOSPITAL FOR WOMEN AND CHILDREN, EGMORE, MADRAS.

Annual Clinical Report for the Year 1935.

This is a most excellent report. It deals very fully with the work of a large hospital which is organized in six sections, viz.: (1) Antenatal, (2) Maternity, (3) Post-maternity, (4) Children, (5) Gynaecology, and (6) General Diseases. In all there were 9,796 admissions during the year: 2,408 patients were treated in the Antenatal Department, 4,065 patients were delivered in the Maternity Department, 218 patients were delivered at home and were admitted to the Post-maternity Department 24 hours after the confinement. Not only is the actual volume of work enormous, but the staff is faced with many complications with which we in this country never have to deal. Among the tropical horrors enumerated are dysentery, leprosy, filariasis, smallpox, ankylostomiasis, and malaria. "The pestilence that wasteth by noonday" is no mere phrase in this institution. Severe anaemia is very common. It is noted as a dangerous complication in 212 out of 3,092 patients who delivered themselves spontaneously.

Considering the conditions in which the work is carried on the results are good. This is particularly true of the breech extractions and the cases of face presentation. It would be unfair to say that the results in placenta praevia are poor (7 out of 40 patients died) because in all probability the majority of the cases were admitted too late.

The reader should observe, however, that the results are presented in such a way that they cannot be read off and directly compared with the corresponding figures published in the average report. The maternal mortality, for instance, is calculated on the patients in the Maternity Department only, and does not include patients who died in the Antenatal Department as is customary in hospital reports in this country If the report is carefully read this error will be avoided as it is obvious that the results of each department are stated individually, but a casual reader might easily be misled. Perhaps the authors would consider rectifying this discrepancy in their next issue?

On page 23 an interesting table is given in which the causes of maternal morbidity are set out. I would suggest that the 50 cases of "retained fragments or lochia" should be included with or added to the 172 cases of "uterine sepsis". Again, can albuminuria, constipation, and reaction after post-partum or ante-partum haemorrhage, or saline infusion possibly be the essential cause of pyrexia in 77 cases?

There are several mistakes in spelling throughout the report, but it would

not serve any purpose to mention them in detail. Indeed, one may have spent too much time in finding fault as it is. And so, to correct any false impression which may have been created, the first statement in this report may be repeated—"this is a most excellent report." Its authors will realize that it is not necessary to deal with the report at length, since in its general nature it so closely resembles that of the Bombay report already reviewed.

T.H.

BOOK REVIEWS.

"Pre-natal and Post-natal Management," by J. St. George Wilson, M.C., F.R.C.S., F.C.O.G., Obstetric and Gynaecological Surgeon, Royal Infirmary, Liverpool. Pp. 206. London: Edward Arnold & Co., 1937. Price, 10/6 net.

Recent publication by experienced obstetricians of manuals with synonymous titles to the above suggests that now is an opportune moment to consider generally the scope of such works and the standard by which they should be judged. They could be more accurately entitled "Obstetrical Antenatal Management" as little more than one aspect of a much wider subject is presented. Even with a title thus limited at least a brief summary of all that is implied in an efficient and up-to-date service should be included in order to give some impression of its manifold purpose, the spirit in which it is to be pursued, the interdependence of its various parts and their relation to other services of a like nature. It is especially important in the case of the training schools, where the clinics could be better described as "consultative clinics," in which the student rarely sees more than its purely obstetric work. In these schools, too, the clinics are often not fully abreast of present-day requirements, many of them not having visitors enough to cope with delinquencies in attendance, much less to carry out the necessary social and educational work among the mothers. Thus students at their final examination and practitioners under examination for postgraduate diplomas are rarely found to have any conception of antenatal work beyond that of the old-fashioned clinics and almost invariably describe its purpose solely as the picking out of possible trouble ahead by testing urine, measuring the pelvis and palpating the abdomen. They show a passing acquaintance with the newer methods of diagnosis and treatment, but little of the newer thought in Medicine with its greater emphasis on constructive hygiene, prevention, the study of the psychology and social circumstances of patients and, in the matter under discussion, the education and training of the mother in mothercraft and the rearing of her family. Some of the teaching schools, too, have not yet instituted child-welfare clinics or have been but recently driven to do so in order to comply with the new regulations of the General Medical Council. Their students have thus little or no opportunity to recognize that antenatal and post-natal supervision are but a specialized part of a system of constructive hygiene with a continuity of purpose directed towards the improvement of the health and physique of the rising generation.

For these reasons and in view of the large share of the supervision of expectant mothers undertaken by clinics of the public health authorities, their methods and the services provided are deserving of attention in books dealing with such supervision. Established under the aegis of medical officers of health with a wide outlook over the health and efficiency of the community and developing on other lines than the hospital clinics, they

offer many lessons to practitioners and hospitals of the means by which a perspective distorted by too close a view of obstetric pathology may be corrected. The converse is likewise true that the public clinics have been weak on the obstetric side and have much to learn from the hospitals. This weakness may be largely ascribed to staffing by whole-time officers, sometimes with a diploma in public health but rarely with more than a student's experience of clinical midwifery, and to pre-natal care being divorced from the rest of midwifery practice whereby these officials had no real opportunity of learning from their own mistakes.

The work would have been better done by the family practitioner than whole-time officers had he been sufficiently equipped in the methods of constructive hygiene and able to give the regular and punctual attendance essential to the success of the clinic. But sporadic attempts to bring him into the scheme were too unfavourable to warrant extension, and the suggestion has been put forward that the medical side of antenatal care might be conducted by the practitioner in his surgery and leave the constructive, instructional, and social side to the officials of the health department. Such a scheme is open to the same objection as that adopted by involving multiplication of advisers and breaking up the unity of the service. The work of the clinic and attendance on labour and lying-in ought to be under single guidance, and practice and instruction on common lines throughout, whether carried out by general practitioner, whole-time officer, health visitor, midwife, or other agent.

So little has been the co-operation between the two groups that the one has not learnt from the other. All the greater need of writers of these manuals to give due prominence to those aspects of pre-natal management in which the public clinics have been most successful. Though not as yet applicable, the chief justification for their publication is that they might fill the blank left by textbooks on midwifery in which the obstetric portion of antenatal care is alone considered.

Before passing to the book now before us, a few words may be added to point the moral or adorn the tail of this exordium. Its moral is that no book on antenatal care will satisfy unless it presents all activities embraced therein in due perspective. If vindication of or apology for it be required, the need for plain speaking may be pleaded in view of the published evidence of narrowness of vision in a branch of Medicine in which the general public as well as other branches of the profession take an active interest. The repute of obstetricians will suffer if a change of outlook must be forced on them from without their ranks.

Mr. St. George Wilson's manual is a very good sample of that portion of pre-natal and post-natal management visible between obstetric blinkers limiting the outlook to little more than the beaten track. But from much travelling over it, every yard is familiar to him and all the recent advances in diagnosis and treatment that make travel easier. Without any preliminaries he starts straight away with the interrogation and examination of the patient, in which he sets out what he has himself found most useful and illustrates it with highly instructive diagrams. Those showing "the amount of the foetal head felt on abdominal palpation as it sinks below the

symphysis pubis" are particularly worthy of commendation for the way they teach very important lessons described in a few lines of text. In the next section, the instruction that Hegar's sign is elicited with the fingers in the posterior fornix must surely be a *lapsus calami*; could the body of the uterus thus appear bimanually "quite separate from the cervix"? The space allotted to the management of normal pregnancy is wholly inadequate to the important part it plays in pre-natal supervision; it results, for instance, in the diet and nutrition of the expectant mother, a matter of general concern throughout the country, being dismissed in little over a page.

The space devoted to the physiological and its promotion as compared with that to the pathological aspects is insufficient to maintain a balance between the two in accord with modern ideas of the purpose and conduct of pre-natal care. It is not that constructive physiology is ignored; far from it, there is much excellent advice in this regard that makes us wish for more. Thus a condition in which primary uterine inertia is associated with ovarian deficiency is described with the signs and symptoms for its recognition; for its treatment the exhibition of small doses of quinine hydrochloride or large doses of oestrin during the last 3 or 4 weeks of pregnancy is proposed. There is an admirable discussion of the purpose of a trial labour in which the author rejects its misinterpretation by those obsessed by the necessity for precise pelvic and foetal measurements and reserves the term for a test of the capability of the uterine musculature to pass the foetus through a given pelvis, i.e., as a trial of uterine function rather than pelvic capacity. The much greater frequency of weakness of function, as the chief factor in failure to achieve natural expulsion in cases with an apparently normal pelvis, is rightly stressed in place of the customary but ill-founded explanations of disproportion or malposition. Again the post-natal remedial exercises, with clear instructions and excellent photographic reproductions, are very welcome and an obvious constructive measure to promote functional recovery in overstretched muscles. Similar exercises for the expectant mother are neither so obvious nor so easy to design and apply, but these grounds scarcely justify the almost pontifical pronouncement, "We do not believe in physical exercises which allege to prepare for labour". We take it that this statement is based on an unfavourable experience, but would point out that time and patient trial are necessary before a satisfactory and simple form of pregnancy exercises can be devised. It would certainly be unfortunate if further efforts on a large scale were discouraged by this dictum. Exercises planned to promote the application of muscular effort to the best advantage during labour and to avoid fatigue by relaxation when effort is not required are as rational a constructive measure for combined voluntary and involuntary muscular action as practice and training for wholly voluntary muscular exercises.

The management of the whole woman, psychical as well as physical, calls for full consideration and yet neither in the investigation of the patient nor under general maternal conditions is her reaction to childbearing mentioned. The section on toxaemia, in which the idea of a disorder of the water-metabolism is preferred and treatment based thereon, is suggestive and interesting. The indications for the induction of abortion are extended beyond those laid down by the legal pundits who make it clear that danger

to the life or health of the mother will always be accepted, but not eugenic, sociological or other considerations than medical. Hence the shock of finding a group of indications headed "paternal".

This manual has distinctive characteristics, the most striking being its exhibition of the author's individuality in text and diagram. A decided effort towards brevity is also present, meaning being generally conveyed without dubiety. A statement that startles and then excites curiosity as to the possibility of a hidden meaning is "the presence of gonorrhoeal warts about the vulva and condylomata on the perineum disclose the presence of gonorrhoea and syphilis respectively". That gonorrhoeal warts are due to gonorrhoea admits of no possible doubt whatever, but does the statement imply that warts in this region, even if diagnosed as 'agonorrhoeal', are yet due to that infection or may they be regarded as due to something else? Revision has been satisfactory save for the invariable dropping of an aspirate from the name of one of the joint discoverers of a biological test for pregnancy and the constant perpetration of the pleonasm "full term". This short manual will assist greatly towards a better obstetric management of the pregnant and puerperal woman but we cannot conceal a feeling of disappointment that the full integration of antenatal supervision is unrepresented. Publishers as well as author deserve congratulation on the format and excellent illustrations.

John S. Fairbairn.

"Operative Obstetrics." By Professor J. M. Munro Kerr, LL.D., M.D. F.C.O.G. Fourth Edition. With the assistance of Donald McIntyre, M.D., F.C.O.G., and D. Fyfe Anderson, M.D. London: Ballière, Tindall, and Cox. Pp. xii + 848, with 338 illustrations. Price 45/-.

It is always of interest to consider the motives that have impelled various members of the medical profession to specialize in the practice of obstetrics. Some of these motives are doubtless more praiseworthy than others; but it is indeed refreshing to recognize that one of our most eminent masters of the surgical art has deliberately welcomed the introduction thereto of an additional dimension, as represented by a variable time factor. Most of us prefer to operate at a prearranged hour, and under conditions of our own choice, although these practical ideals are so frequently frustrated by the hysterical demands of our clientele. Lesser men prefer post-mortems. Professor Munro Kerr, however, selects operative obstetrics as "a department of surgery which is particularly 'intriguing', because in it finesse and timing of interference plays so important a role . . . the knowing *when* and *how* to interfere. These questions have always appealed to me . . ." Here we have the idea of a first-class rifle shot who genuinely prefers a moving target. Accustomed as we are to the one-track mind of to-day, this modestly expressed, and quite unconsciously implied, association with the outlook of an Einstein is altogether admirable and inspiring.

The new edition has been almost entirely re-written and its presentation is excellent from every point of view. An inadequate supply of superlatives tempts the reviewer to counsel wholesale purchase and universal study thereof, and to leave it at that; but the appeal of this book compels even

a reviewer to read each word from cover to cover with humility and respect, and inevitably overpowers his firm determination to remain unbiassed by a personal regard for the author. Erudition, experience, humour, philosophy, and common sense are written large on every page.

The preface to the first edition was written in Glasgow (1908), and the preface to the present edition in London (1937). Glasgow's loss is London's gain; but it is relevant to express the opinion that the Glasgow school of obstetrics is possibly the best in the British Isles, whether on account of material or personnel, or both; and it is only fair to observe that Munro Kerr has probably found little of obstetric value in the South, beyond a warm welcome from his colleagues.

In the table of contents we find that 18 chapters out of 37 are devoted to "dystocia" in one form or another, yet in the text a definition of dystocia is wanting. This may appear trivial to those who habitually apply the term to all cases of difficult or painful childbirth; but we venture to hope and believe that the book will be read by undergraduates and the newly qualified, as well as by experts, and we have to recognize, with regret, that the classical education of the modern medical student has been sacrificed to uninformed public opinion, together with his scientific training. Strange as it may seem, a considerable proportion of our younger generation regards dystocia as synonymous with disproportion: to many the word is entirely unfamiliar.

The chapters on antenatal examination and intra-natal care are particularly well balanced. They afford sound practical advice without frills, stunts, or prejudice. The chapter on dystocia resulting from faults in the forces, an ever fascinating subject, is extremely interesting and up to date, although no one knows better than the author that there are many more chapters to be written before the problems concerned are finally solved.

In the following sections, on faults in the foetus, divergent opinions are respectfully and courteously considered. In each condition the summing up is masterly. Special note may be made of the treatment of breech presentations: examination candidates, who have been thoroughly confused in recent years, will find peace of mind in Chapter VII, and many a child as yet unborn will owe its life thereto.

In the midst of a feast it is comforting to self-esteem to find at least one omission. In the chapter on contracted pelves there is no mention of that secondary pelvic contraction, due to subluxation of the sacro-iliac joints, which occasionally afflicts multiparous women of the hospital class, *after* one or other of their several confinements, to their future obstetric disadvantage. The chapter on "Pelvic Disproportion" thoroughly fulfils our expectations: and that is the highest praise. Every medical student knows Munro Kerr, even if it be in this connexion alone. The average candidate firmly believes he has only to mention the author's name, together with that blessed word "overlap", in order to satisfy the examiner that problems of disproportion do not present any difficulties. The radiographer has been treated with the utmost consideration; but we are quite fairly led to understand that radiography has its limitations. "Allow me my hands, a pair of calipers, and the use of anaesthesia if necessary, and I will tell early in labour whether a head will pass through or not up to a 6 to 8 per cent error. I make no claim to be able to do this at the thirty-sixth week

of pregnancy, as a number of my obstetric friends in this country profess is possible . . . ." The induction of labour in primigravidae is opposed with reason, and it is stated without prejudice that induction of labour in general is regarded unfavourably in every country other than our own. We all recognize that a contracted bony outlet presents the great stumbling block to the whole-hearted advocate of trial labour. The logical mind of the author surmounts this difficulty by admitting the only satisfactory theoretical solution—symphysiotomy. With regard to the practice, he is well qualified to speak from experience of a procedure that most of us frankly fear to adopt.

The chapter on retraction ring and contraction ring is a little confusing, and we wonder, with all respect, whether it is altogether accurate. What is commonly known as a contraction ring is described as a retraction ring in a condition of spasm. Does the site of the stricture thus correspond "in the majority of cases"?

Occasional criticism is salutary and fulsome praise is nauseating, so let us pass through further admirable sections to this not unimportant statement: "All are agreed that, whenever a retrodisplacement is discovered early in pregnancy, it should be corrected". How many are the abortions which have been caused by the well-intentioned efforts of fiddling practitioners! There is nothing that appeals to the gynaecologically inclined doctor so much as a retroverted uterus: to him it is the *fons et origo* of all the ills to which the female flesh is heir. He does not need any encouragement from high authority.

We would commend to our good friend the Nuffield Professor of Anaesthesia the section of "Anaesthetics and Analgesics." Although, as we we are told in the text, this is not strictly speaking a department of operative obstetrics, the review is most interesting and stimulating. If we consider the greatest good of the greatest number, the subject is possibly of greater importance than all the manipulations of midwifery. At any rate here is a fruitful field for clinical research.

Caesarean section is treated with the utmost clarity, as regards both indications and technique. In cases of medium disproportion it is properly stated that an estimate of the relative size of foetal head and maternal pelvis can only be made with exactness after labour has been in progress for some little time. A decision should then be made whether to perform Caesarean section or to embark upon a trial of labour. "How long that trial may be will depend upon developments. I can see no other rational alternative". Nor can we; although some of us may prefer to avoid, if possible, Caesarean section very late in labour, and on that account regard the preliminary procedure as a fair trial, at the acknowledged risk of performing a few, a very few, unnecessary operations. "The foregoing remarks apply to the primipara. The multipara is quite another problem". That again is true and important. A purist would prefer "primigravida" and "multigravida"; but this is merely a frivolous observation. Great faith is expressed in the reliability of the lower segment scar; perhaps we must admit without reserve that it has now stood the test of time. We are very glad to find that Professor Munro Kerr advocates Caesarean section in pre-eclamptic patients who are gravely ill and who do not respond to medical treatment, in cases of eclampsia of the fulminating type, and

in cases of eclampsia proper which do not immediately respond to the usual therapeutic measures. The cautious manner of dealing with suspect and probably septic cases reminds us that a great clinician is never carried away by the blind belief that any single procedure will overcome all obstacles.

Induction of labour by rupture of the membranes is viewed with some reservation. At the present time its advocates have it all their own way—a not uncommon reaction to the full backward swing of the pendulum. "I hesitate to give it unconditional support until it has been tried out a little longer".

The sections on abortion are admittedly discursive, if we must insist that a work on operative obstetrics should be essentially technical in its scope. But we have found them altogether admirable, and their observations are indeed timely. It is well stated that many of those who are at present advocating extension of induction of abortion on ethical, sociological, eugenic, or humanitarian grounds, seem to think that the operation is no more serious than the extraction of a tooth. They must clearly understand that the operation is attended with a considerable amount of risk. This truth, obvious as it may be to every gynaecologist of experience, cannot be too often or too emphatically repeated. The various injuries which may be inflicted in the induction of abortion are graphically illustrated. "As far as I am aware, there is no special desire on the part of the medical profession to have the existing law altered. This elastic position has many advantages: it permits considerable latitude".

The importance of corpus luteum therapy in cases of habitual abortion, so well proved in recent years, is apparently underestimated. In cases of incomplete abortion with a febrile temperature and fast pulse-rate, it is taken for granted that the uterus should be evacuated if the cervix is dilated and if the ovum can be readily removed with the finger or ovum-forceps. We venture to agree with the further opinion, although it may be debated: "If the cervix is closed . . . while an advocate of expectant treatment by means of drainage, glycerine, quinine, and pituitrin, I have had so many disappointments—being compelled in many cases ultimately to employ active measures—that I try whenever possible to get the ovum away".

We incline to the view that ectopic gestation lies for all practical purposes within the province of a gynaecological rather than an obstetric treatise, and for that reason we find the chapter concerned to be somewhat lengthy: there is too much overlapping in an overburdened curriculum. However, that is merely a matter of opinion, and on the other hand the author's remarks are almost entirely confined to the clinical and operative aspects of the subject.

The treatment of placenta praevia is orthodox, though none the less sound on that account. In the same chapter there is a particularly sane and interesting survey of the aetiological factors responsible for accidental haemorrhage. In severe post-partum haemorrhage packing the uterus is preferred to manual compression.

A reviewer is briefed to criticize, and nowadays he may elect to air his own opinions with complete disregard for the subject of his review; so let us repeat that the bulk of this great work is beyond reproach, including all those major sections to which no reference has here been made.

With that true modesty which is born of experience, tolerance and greatness, Professor Munro Kerr has possibly paid a little too much attention to the written words of others—"the Literature" many are pleased to call it, as if a whole library of publications could deal with an obstetric emergency, or as if most of it were really literature. At times the scholar and the teacher have gained the upper hand of the surgeon. Surely there must be some place left in the world for the man of first hand clinical experience and judgment, of decision and deeds, rather than of words and papers. From him we are willing to accept an *ipse dixit* without any display of dialectics. All too often discussion implies advertisement or adventitious padding: but in this case we freely recognize and welcome a manifestation of the author's natural courtesy and of his passionate desire for equity.

A classic work, magnificent in conception and delivery.

Frank Cook.

"Annual Report on the Results of Radiotherapy in Cancer of the Uterine Cervix." First volume: Statements of results obtained in 1930 and previous years (collated in 1936). Series of League of Nations publications. III. "Health," 1937, iii, 2. Official No.: C.H. 1225. 74 pp.

THE first annual report of the results of radiotherapy in cancer of the cervix uteri has been published by the Health Organization of the League of Nations, according to the recommendations of its Radiological Sub-Commission, to provide a convenient statistical reference work. Agreed rules for the setting up of statistics have been observed, and to eliminate chance no percentages are calculated on less than 15 cases; between 15 and 100 a degree of error occurs, while in over 100 cases the percentage is taken as being reliable. It is appreciated that the clinical analyses of cases from different hospitals are not always comparable owing to selection of cases, and a table showing the number of patients seen, but not treated, is essential. At the Institut de Radium, Paris, 47 out of 156 patients were not treated, 25 owing to lack of accommodation, and in such cases selection is bound to occur. At Radiumhemmet only 7 patients out of 205 were not treated, owing to advanced local or poor general condition, and this may account in a slight degree for the better results of the French school. To overcome this difficulty the four grades of advancement were evolved, but in actual practice these are found to be fallacious for grades 1 and 3, because many patients with a growth confined to the cervix have been found at operation to have invaded glands.

All these factors have to be reduced to a minimum before assessing differences in the results of the different methods of treatment.

Two series of tables are issued, one giving annual statements relating to cases treated in 1930, the other dealing with results obtained at an earlier period. The report is strictly confined to carcinoma of the cervix, when planned radiological treatment is carried out as the primary method of treatment. This includes stump carcinoma, but excludes recurrences after operation, patients treated elsewhere, and precancerous conditions.

As the basis of treatment in most clinics is the Paris or Stockholm technique, the results from these two clinics form the best guide.

Paris (Dr. A. Lacassagne): Prior to 1930 statistics are available since 1919. Out of a total of 1,263 patients treated from 1919 to 1929, the following were alive in 1936: patients treated in stage 1, 59.3 per cent; in stage 2, 37.8 per cent; in stage 3, 22.3 per cent; in stage 4, 1 per cent.

Of patients treated in 1930, the following were alive in 1936: patients treated in stage 1, 75 per cent; in stage 2, 55 per cent; in stage 3, 34 per cent; of those patients treated in stage 4, not one was alive in 1936.

From 1919 to 1929 the results have gradually improved, from 6.7 per cent to 42.2 per cent in all stages.

Radiumhemmet (Dr. J. Heyman): Of patients treated from 1914 to 1929, the following were alive in 1936: patients treated in stage 1, 52.1 per cent; in stage 2, 32.9 per cent; in stage 3, 14.6 per cent; in stage 4, 5.2 per cent.

Of patients treated in 1930, the following were alive in 1936: patients treated in stage 1, 5 out of 12 cases; in stage 2, 43.3 per cent; in stage 3, 17.2 per cent; in stage 4, 9.1 per cent.

From the detailed tables it will be seen that from 1914 to 1919 only advanced cases were treated by radiotherapy, and it was not until 1921 that early cases were treated in sufficient numbers to be of value statistically, while even in 1930 the proportion of advanced cases is greater than in Paris.

At the Marie Curie Hospital, London (Dr. Hurdon), statistics are available since 1925.

Of patients treated in 1930, the following were alive in 1936: patients treated in stage 1, 5 out of 6 cases; in stage 2, 65.6 per cent; in stage 3, 33.3 per cent; in stage 4, 17.6 per cent; and these results appear to have been achieved without selection.

Statements have also been submitted by the Radium Centre of the London County Council by Sir Comyns Berkeley, the Liverpool Radium Institute by Dr. P. Malpas, and Le Centre des Tumeurs de L'Universite de Bruxelles by Professor Murdoch.

The greatest interest of the report lies in the improvement in results at Paris and Stockholm as the technique was elaborated and perfected.

The advisory committee—Dr. J. Heyman (Stockholm), Dr. A. Lacassagne (Paris), and Lieutenant-Colonel A. B. Smallman (London)—emphasize the fact that this first report is experimental, and invite the collaboration of institutes and clinics throughout the world.

I.G.W.

"Hospitiology." A monograph by J. J. GOLUB, M.D.

In reviewing Dr. Golub's article on hospitiology we have been asked to answer two questions, first, what is our frank opinion of this new word, and, secondly, what is our opinion of the subject matter contained in his monograph.

Hospitiology is undoubtedly a word to the choosing of which Dr. Golub has paid considerable attention and spent considerable time. It is certainly

neat and descriptive, but we cannot refrain from pointing out that it is a hybrid word from which medical language, as a whole, already suffers too much. We must not forget that medicine is a learned profession and the acceptance of another Latin-Greek word is not rendered the more palatable by the fact that we already tolerate cardiology, vulvectomy, ovariotomy, and the like, all of which to those of us who are classical scholars are little short of nauseating.

We will not, however, quibble over pedantry but pass to the subject-matter of the article. Briefly outlined, "hospitiology is a specialty that would serve medicine in its study and work in the healing of the sick, medical education, nursing education, and the prevention of disease." These are Dr. Golub's own words. Hospitiology, we therefore take it, is the creation of a specialism, and we may say the creation of an ideal, whereby all the medical, administrative, social, economical and constructional services of a hospital would be centralized and unified into one corporate or individual body. Being conservative and having had the privilege of being cradled in the best principles of one of the great London teaching hospitals, we are not prepared to say whether this is a good or a bad departure from a system which has stood the test of time; moreover, we ask this pertinent question: Are London County Council Hospitals, in which to a certain extent the principles of hospitiology are at the present time in existence any better for it than the voluntary hospitals themselves? Obviously this is a question which we cannot answer.

While, therefore, fully recognizing that the ideal of centralizaton and unification of the various water-tight departments of a hospital might and does convey certain benefits it is our duty to point out that a bureaucratic dictatorship vested in the wrong type of man, or woman, would lead to abuses, a breakdown of the whole system, in a word, a state of anarchy. To mention one possible abuse which intimately concerns us as physicians we refer to the following paragraph in Dr. Golub's article: "The principles of hospitiology would outline and guide the activities of the house-staff member who first visits the patient—his promptness, his attitude and manner, his recorded provisional examination, his intelligent orders for laboratory and X-ray examinations, and his prompt notification of the visiting staff-member. Underlying the character of the resident's and intern's work are their personality and medical education. How were they selected? Was the selection made on the basis of examination?" We offer no comment on these words except to say that the hospitiologist would certainly have his finger in what is regarded as an exclusive medical pie.

A further point is the education of the hospitiologist. He would undoubtedly have to be a medical man and as such the study of hospitiology would throw a very considerable burden on to the back of an already overloaded if willing curriculum.

Let us, therefore, hold a watching brief on the question of hospitiology. If it is to prove a practical ideal then the future will be time enough for us to embrace or reject it.

J.H.

"Gentlemen of the Jury." By DORIS GORDON, F.R.C.S.E., and FRANCIS BENNETT, M.D. Published by Thomas Avery & Sons, Ltd., New Plymouth, New Zealand. Price not known.

To the world as jury, Dr. Doris Gordon and Dr. F. Bennett state a very fair case showing sound judgment in the reasons they give for the declining birth-rate of New Zealand.

It is impossible accurately to state how widely contraceptives are used, but if we assume that every case of criminal abortion is one of failure of the contraceptive, whatever statistics are available on abortion will give us some idea of the prevalence of the use of contraceptives.

The writers point out that New Zealand had a higher death-rate from abortion, over a period of three years, than the United States, Canada, England and Wales, Ireland, Holland, Australia, and Scotland.

The doctors at present are powerless, they can but point out the dangers of abortion and do what they can to help those whom the abortionist has irretrievably injured.

Even when the abortionist is brought to justice it is difficult to get a conviction, the jury regarding the abortionist as a friend to some woman in trouble rather than a menace to society.

It is a book to make readers of any nationality think, as the facts apply to most of the white countries with a falling birth-rate.

W.R.W.

"The Rabbit Test: for the Detection of Chorion Tissue in the Body and the Determination of its Proliferative Activity." By S. B. ANKLESARIA, M.D. (Bom.), Honorary Obstetrician and Gynaecologist, Sheth Vadilal Sarabhai General Hospital and Chinai Maternity Home, Ahmedabad. Bombay Fort Printng Press, 1937.

DR. S. B. ANKLESARIA has written on the Friedman test for pregnancy a book of 161 pages and this is based on a personal experience of 802 tests. It would be a difficult task at any time, even with considerable clinical and pathological material to have sufficient data for writing more than a few pages upon this biological test. The factors of importance in this test to the clinician and pathologist are, firstly, the accuracy of the test in pregnancy; secondly, its diagnostic value in hydatidiform mole, chorion-epithelioma, and teratoma; thirdly, the interpretation of positive and negative tests; fourthly, conditions of the rabbit or urine which vitiate the test; and, finally, notes on the technique in the ordinary test for pregnancy, and in other clinical conditions associated with a very large output of prolan. Of these. the first has received more than adequate attention by most laboratories all over the world, and it is now generally agreed that the error is less than 1 per cent, yet the author devotes fully 7 pages to this subject. Other examples of the unnecessary amount of detail in this publication are the 6 pages on the technique of the original Aschheim-Zondek test, 11 pages on the technique of the Friedman test. Despite this verbage, however, no work has been done on the cause of toxicity of the urine—a very practical and theoretical point. Teratoma is not mentioned.

This book is disappointing, and one feels that the author would have been better advised to have written 1 or 2 simple papers on personal experience with the Friedman test instead of a monograph beginning with a chapter on "The Evolution Concept of Motherhood." In the very last paragraph the author draws attention to an important legal point, namely, that the sample of urine to be tested for pregnancy must be obtained directly from the patient.

Review of Current Literature.

Director: FREDERICK ROQUES, M.A., M.D., M.Chir. (Cantab), F.R.C.S., F.C.O.G.

THIS Review contains the lists of contents and abstracts of the more important articles from the following journals with which the "Journal of Obstetrics and Gynæcology of the British Empire" exchanges :—

British.—The Lancet; British Medical Journal.

Canadian.—The Canadian Medical Association Journal; Bulletin Médical de Quebec.

Australian.—Medical Journal of Australia; The Australian and New Zealand Journal of Surgery.

Indian.—The Calcutta Medical Journal.

American.—American Journal of Obstetrics and Gynecology; The Journal of the American Medical Association; Surgery, Gynecology and Obstetrics; American Journal of Diseases of Children.

French.—La Gynécologie; Gynécologie et Obstétrique; Bulletin de la Société d'Obstétrique et de Gynécologie de Paris.

Belgian.—Bruxelles Médical.

Italian.—Annali di Obstetrica e Ginecologia; Archivo di Obstetrica e Ginecologia; Revista Italiana di Ginecologia, Bologna.

German.—Archiv für Gynäkologie; Zeitschrift für Geburtshülfe und Gynäkologie; Zentralblatt für Gynäkologie; Monatsschrift für Geburtshülfe und Gynäkologie; Münchener Medizinsche Wochenschrift; Monatsschrift für Krebsbekampfung.

Scandinavian.—Acta Obstetrica Scandinavica.

South American.—Boletin de la Sociedad Obstetricia y Ginecologia de Buenos Ayres.

Japanese.—Japanese Journal of Obstetrics and Gynæcology.

The Review of Current Literature thus keeps the readers of the Journal in touch with current literature throughout the world. At the end of the year an Index of all the subjects contained in the articles of the above journals is printed. Arrangements are also made to include abstracts of important articles on border-line subjects, such as Physiology, Biology and Biochemistry.

LIST OF ABSTRACTORS.

London: J. BEATTIE, F.R.C.S.; A. C. BELL, F.R.C.S.; R. K. BOWES, F.R.C.S.; J. LYLE CAMERON, F.R.C.S.; ALBERT DAVIS, F.R.C.S.; F. H. FINLAISON, F.R.C.S.; B. GILBERT, F.R.C.S.; R. J. KELLAR, F.R.C.S.; R. LIGHTWOOD, F.R.C.P.; J. A. MOORE, F.R.C.S.; C. D. READ, F.R.C.S. (Edin.); F. ROQUES, F.R.C.S.; R. WINTERTON, F.R.C.S.

Felsted: W. E. CROWTHER, M.B.

Leeds: R. H. B. ADAMSON, M.D., AND B. JEAFFRESON, F.R.C.S.

Liverpool: M. DATNOW, F.R.C.S.; P. MALPAS, F.R.C.S.; T. N. A. JEFFCOATE, F.R.C.S.

Manchester: R. NEWTON, M.D.

Glasgow: JANE H. FILSHILL.

The Edinburgh Medical Journal.

Vol. xliv, No. 5, 1937.

*Implantation of the ovum in mammals in the light of recent research. T. H. Bryce.

IMPLANTATION OF THE OVUM IN MAMMALS IN THE LIGHT OF RECENT RESEARCH.

The part played by the endometrium in implantation and placental formation is comparatively passive when compared with that of the trophoblast. The actual mode of implantation in the human is not known. The general result of a survey of the behaviour of the endometrium in the light of new research confirms the old view, that the cyclic changes imply a preparation of the tissue for implantation, and not that menstruation represents an abortion, as it were, of an unfertilized ovum. Such an idea is untenable in view of the facts now known regarding the occurrence of menstruation in the absence of ovulation.

J. Moore.

The Canadian Medical Association Journal.

Vol. xxxvii, No. 1, July 1937.

*A plea for conservatism in the use of Caesarean section. L. J. Harris.

Vol. xxxvii, No. 2, August 1937.

*The effects of theelin on anxiety. G. A. Little.

*The biological test for pregnancy. E. W. McHenry and C. H. Best.

*Abdominal pregnancy complicated by appendicitis and bilateral pyosalpinx. W. F. Plewes.

*Early rupture of ectopic pregnancy. S. A. Wallace.

*Pigmentation of amniotic fluid, sac, and vernix caseosa, and Bandl-like ring of the uterus. J. E. McArthur.

A PLEA FOR CONSERVATISM IN THE USE OF CAESAREAN SECTION.

Caesarean section is being far too frequently performed on unjustifiable indications. Plasse has reached the conclusion that 25,000 Caesarean sections are performed annually in U.S.A., with a maternal mortality of 10 per cent: 20 times the rate for vaginal delivery. At least 20,000 of these operations are unnecessary.

In U.S.A. 7 per cent of all maternal deaths are due to Caesarean section, and 24 per cent of all maternal operative deaths are due to the same cause. In 44 per cent of the patients who died the operation was performed for toxaemia. In the very best hands, in English hospitals, the death-rate for Caesarean section is 5.8 per cent, whereas the death-rate following vaginal delivery is 0.45 per cent.

The indications for the operation seem to have spread to include every obstetrical complication and the operation is much too often performed by unskilled operators. Inexperienced practitioners frequently resort to the operation without first consulting a genuine obstetrician of wide experience, extensive knowledge and sound judgment.

The author cites a few reasons which lead practitioners to perform Caesarean section and which cannot be considered indications. It is an easy way out of all obstetrical difficulties, saving time, work and worry; it is dramatic and impresses the family, and there is little regard for an ordinary vaginal delivery. It is frequently performed when the medical attendant, finding the family exhibiting anxiety, is afraid lest another practitioner be called who will advise operation and reap all the glory. A larger financial reward is received for the operation than for vaginal delivery and occasionally patients demand operation in the mistaken belief that they are thereby avoiding pain and suffering.

De Lee describes Caesarean section as a noble operation, increasingly misused; the most dangerous of all abdominal operations, having a mortality of 6 to 10 per cent. All too frequently watchful expectancy, the old friend of the obstetrician, is forgotten, and real obstetrics seem to have disappeared.

A very full bibliography is appended.

THE EFFECTS OF THEELIN ON ANXIETY.

The author has made very extensive investigations into the results of theelin treatment on anxiety states, and quotes a series of 18 cases to illustrate the type of patient, age and mental and nervous conditions. In 11 of these cases the anxiety occurred about the time of, and in association with, the menopause. The remaining 6 cases occurred apart from the menopause.

The author is of the opinion, as a result of these investigations, that anxiety symptoms arise from an abnormal action of the endocrine glands which control sex activity, and in these states, theelin appears to be almost a specific.

When theelin was administered to patients suffering from anxiety associated with the menopause, they appeared to be almost uniformly benefited. When, however, anxiety states were noted apart from the menopause, the patients seemed to benefit very little from the administration of theelin, and in few cases the results were undesirable. The average dose appears to be 1,000 units in oil twice weekly.

A full bibliography is appended.

THE BIOLOGICAL TEST FOR PREGNANCY.

This is a further report on these investigations following a previous account given in 1930 and 1931. Tests were made of 4,986 cases, but it was possible to verify the accuracy of the test in only 2,359 cases. Out of this number incorrect results were obtained in 46, 1.9 per cent.

There were one or two factors which admitted of negative error; for example, the patient might have been pregnant and at the time of the test the ovum was dead in the uterus.

It is pointed out that positive tests are indicative of actively living chorionic tissue, such as one might get in chorionic carcinoma or hydatidiform mole.

The technique is not described in detail but is stated to be almost the same as that described in the 1932 report. There is this slight modification,

that two injections of urine, 12 hours apart, were given and 2 rabbits were used for each test. The Friedman method was preferred to that of Aschheim and Zondek.

A short bibliography is appended.

ABDOMINAL PREGNANCY COMPLICATED BY APPENDICITIS AND BILATERAL PYOSALPINX.

Abdominal pregnancy has been known and cases reported since 1809, and the author quotes abstracts from the literature to illustrate the reports of these cases.

It is admitted by the most experienced of gynaecologists that the diagnosis of abdominal pregnancy is extremely difficult and is probably made in less than one-third of all cases occurring.

One of the chief causes of fatalities when an attempt is made to remove the foetus is haemorrhage from the site of attachment to the placenta, and it is recommended that the placenta be left *in situ* while the edges of the sac are sewn to the abdominal wall, the cavity being packed with gauze.

The author cites a case of a patient aged 31 years. Her last pregnancy was 13 years previously. She complained of lower abdominal pain for 5 months and irregular uterine bleeding for 4 months. When seen her temperature was 101°F., pulse-rate 96, and blood-count normal. An Aschheim-Zondek test was negative, and the urine showed no abnormality. Abdominal examination revealed an irregular swelling with three prominences, the highest extending just above the umbilicus. All these swellings were very tender and firm, suggesting fibroids. Vaginal examination revealed a patulous cervix and an ill-defined, tender, semi-solid swelling in the pouch of Douglas.

On abdominal section the omentum was markedly congested and adherent to a large irregular mass reaching as high as the umbilicus. The caecum was adherent to this and the left Fallopian tube was enormously distended and adherent to the descending colon.

When the adhesions were separated the appendix, very much enlarged, distended with pus and gangrenous, was found to be adherent to the right tubal mass. About 600 c.c. of pus, greyish in colour and non-odourous, were removed from the pelvis.

Further investigation revealed an amniotic sac containing a foetus of about 4 months. The placenta was almost completely detached except for a small margin of fixation to the rectum.

Both Fallopian tubes, the appendix, and the placenta were removed and a subtotal hysterectomy was performed. The pelvis was drained and the patient made an uneventful recovery.

A full bibliography is appended.

EARLY RUPTURE OF ECTOPIC PREGNANCY.

This is a case of rupture of a gravid Fallopian tube on the ninth day. The patient's last menstrual period, on November 29th, was regular in time of onset, duration, and in the amount of the loss. On December 8th there was sudden onset of lower right abdominal pain which was persistent in character, spreading towards the left side. Free bleeding from the vagina began

at the same time. On December 13th she had a drive of 80 miles over rough roads. Operation was performed on December 14th, revealing free blood and old clots in the abdomen. There was no uterine enlargement. The distal third of the right Fallopian tube was distended to the size of the index finger, with a clot protruding in the open end. This tube and the appendix were removed; the patient made an uneventful recovery.

PIGMENTATION OF AMNIOTIC FLUID, SAC, AND VERNIX CASEOSA, AND BANDLIKE RING OF UTERUS.

A case is here reported of a Hebrew woman, 26 years of age, pregnant for the second time. The labour was at term and was normal in every way except for some difficulty in removing the placenta. There was, however, this unusual feature, that the liquor amnii, the amniotic sac, the foetal covering of the placenta, even the maternal side of the placenta, and, to a lesser degree, the umbilical cord were of a very distinct yellow colour. The vernix caseosa was also of the same colour. The baby's skin was the usual pinkish colour as also were the mucous membranes, and there was no icteroid tinge to be detected and no icterus developed subsequently. The meconium and urine were normal in colour.

The author regrets the inability to have made a chemical or laboratory examination of the liquor amnii, vernix caseosa or membranes.

The placental retention was due to a contraction ring.

There was nothing in the antenatal care, therapeutics used or dietetic regimen which would account for the pigmentation noticed.

The author quotes two references.

J. Lyle Cameron.

The American Journal of Obstetrics and Gynecology.

Vol. xxxii, No. 5.

The role of lower uterine soft parts in labour. W. E. Caldwell, H. C. Molvy, and A. D'Esopo.

A clinical review of 110 cases of ovarian carcinoma. F. W. Lynch.

*Iliac lymphadenectomy plus radiation in borderline cancer of the cervix. F. J. Taussig.

Premature rupture of the membranes as a means of inducing labour. E. D. Plass and C. W. Seibert.

A study of 1,000 placentae. W. Benson Harer.

*A bacteriological study of 500 consecutive abortions with treatment and results. T. K. Brown and G. A. Hunt.

Similarity in cervix of rhesus monkey and woman. R. L. Dickinson and C. G. Hartman.

Observations upon ovulation in primates. A. H. Morse and G. van Wagenen.

The size and shape of the pelvic inlet as determined by direct measurement. E. A. Schumann.

The investigation of a new pentavalent arsenical preparation, aldarsone, in the treatment of trichomonas vaginitis. P. B. Bland and A. E. Rakoff.

*Management of secondary amenorrhoea of functional origin. A. B. Tamis.

The cell volume following delivery and its relation to blood loss and post-partum infection. J. B. Pastore.

Traumatic gynatresia. F. A. Kassebohm and M. J. Schreiber.

Parental age difference and the conception of congenitally malformed children. D. P. Murphy.

A critical analysis of the first 3,060 cases delivered at the Bronx Hospital. J. I. Kushner.

Interstitial pregnancy. T. K. Reeves.

Epithelioma of the clitoris. Sonya A. Monen.

A new all-metal umbilical cord clamp. C. E. Ziegler.

A brief epitome of gynaecological endocrinology and organotherapy. E. Novak.

Maternal mortality study for Akron, Ohio. G. A. Palmer.

Selected abstracts—Physiology of labour.

Vol. xxxii, No. 6.

Pyelitis in toxaemias of pregnancy. J. P. Peters, P. H. Lavietes, and H. M. Zimmerman.

Blood-volume and plasma-volume changes in eclampsia. W. S. Dieckmann.

Blood lipoids in pre-eclampsia. Eldon M. Boyd.

Therapeutic abortion by means of X-rays. Max D. Mayer, W. Harris, and S. Wimpfheimer.

Calcium and phosphatase studies in cancer of the female sex with a consideration of the basal metabolic rate and urinary *p*H. R. O. Bowman and H. C. Pitts.

An experimental study of dissolution and absorption of retained dead foetûs. A. M. Crossman.

*A biological test for the diagnosis of intra-uterine foetal death. G. H. Rezek.

*Carcinoma of the body of the uterus. C. C. Norris and F. S. Dunne.

*A critical study of the low cervical and classical Caesarean section operations. F. H. Falls.

Analytical study of 347 consecutive Caesarean sections. David Feiner.

A review of 226 cases of obstetric analgesia. Virgil G. Damon.

Further observations with dial urethane for obstetric analgesia. Porter Brown.

Tumours of the ovary. P. Bernstein.

Menstrual bleeding after excision of the corpus luteum followed by oestrin or progestin therapy. H. Wiesbader, E. T. Engle, and P. E. Smith.

Twisted haematosalpinx complicating pregnancy. J. E. Savage.

Comparative study of pelvic temperatures under various therapeutic procedures. H. C. Ingraham.

Tubo-ovarian pregnancy. W. T. Kennedy.

Fatal air embolism on the eighth day of the puerperium. J. K. Quigley and Istvan A. Gáspár.

A full-time pregnancy complicated by an acute intestinal obstruction and false labour pains. J. Casagrande.

Two cases of unruptured ectopic pregnancy. M. M. Scheffler.

Emphysematous vaginitis. J. H. Robberson and May Owen.

Lithopoedion. S. A. Osheroff.

REVIEW OF CURRENT LITERATURE

Collecting a clean specimen of urine. B. H. Carroll.
Pregnancy after the removal of both ovaries. W. A. Scott.
Carcinoma of the cervix in prolapsed uteri. H. Strauss.
The medico-legal aspects of blood grouping. I. Zieve.
Society transactions.
Selected abstracts—Pathology of labour.

Iliac Lymphadenectomy Plus Radiation in Borderline Cancer of the Cervix.

Two years ago Taussig advocated radiation of the primary lesion and surgical removal of the gland-bearing area as the treatment of borderline, group II, cases of carcinoma of the cervix. In this paper he describes the findings and results in 46 cases thus treated. He only considers the operation for patients who are good risks and performs it whenever possible in the younger individuals because of the greater tendency to glandular metastases in such persons. His technique is first to give 1,000 to 1,500 rat-units of deep X-ray therapy spread over 2 weeks; 2 weeks later the iliac lymphatic glands are excised; 2 weeks after that 4,000 to 5,000 Ra.-mg. hours are given with 150 mg. of radium inserted into the uterus; and finally 2,000 to 2,500 rat-units of deep X-rays should be given. He thinks it is important to separate the radium treatment from the operative measures as the death of 2 patients, 4.3 per cent, was, in his opinion, definitely due to this fact. He does not agree with routine ligation of the uterine arteries at the time of removal of the glands as recommended by Duncan, although it may be necessary if a ureteral gland has to be removed. He has completely given up intra-abdominal implantation of radon seeds as it increases the dangers of the operation and is not as effective in dealing with connective tissue extension as deep X-ray therapy. As he has only 2 patients operated upon more than 5 years ago he was not able to give the usual survival-rate which is demanded for all statistics of cancer. However, he gives figures of a two-year survival, 68 per cent, and these compare most favourably with similar borderline cases treated by radium alone. 41 per cent.

In the discussion which followed the reading of this paper Healy thought that the author would find that he had not made any appreciable change of figures in the final analysis. His criticism was that this operation destroyed lymphatics which had been fibrosed by radiation and that fibrosed areas at the edge of the growth would be opened up at the time of operation. He believed that Wertheim's operation preceded by radiation held the best hope of cure. Lynch, on the other hand, thought that this gland resection was well worth doing as he believed that the profession was now curing with radium and X-rays about as many cases as it is ever likely to do.

A Bacteriological Study of 500 Consecutive Abortions, with Treatment and Results.

From this study the authors wish to emphasize the importance of anaerobic organisms as the infecting agents which tend to give rise to a fatal outcome. Of 500 consecutive cases they obtained a positive uterine

culture in 300 cases, 60 per cent, and of these 300 cases 24 were aerobic infections, 8 per cent, 136 were mixed aerobic and anaerobic, 45.3 per cent, and 140 were anaerobic, 46.6 per cent. It was thought that 44.4 per cent of these were not self-induced, and of this number 52.5 per cent gave a negative culture on uterine swabbing whereas of the definitely induced abortions only 30.6 per cent were negative on culture.

The authors use a rather special technique to obtain a uterine swab uncontaminated by the cervical discharge, and this is followed by a careful bimanual examination of the pelvic organs to determine any evidence of spread of the uterine infection into the veins or other structures. A pair of smooth-jawed sponge-holding forceps is inserted into the uterus without an anaesthetic so as not to abolish the sensations of the patient. It is opened and closed while inside the cavity and any debris is removed. The walls are then wiped with a smooth instrument; the uterus is not curetted. This is followed by washing out the uterine cavity with 2 litres of 1:1,000 solution of potassium permanganate at a temperature of 105°F. to 110°F.

The authors find that the temperature usually falls at once to normal and remains so. They strongly advise that this form of treatment should be carried out at the very earliest opportunity before the organisms have begun to invade the uterine wall, parametrium and thrombosed veins. Finally they report that the incidence of the haemolytic streptococcus was very low, 1.8 per cent, but that it played a very important role in the cause of death, 57.1 per cent. The seven cases of the whole series which died were morbid on admission.

Management of Secondary Amenorrhoea of Functional Origin.

Tamis asserts that the cause of the poor results of treatment of this condition with gonadotropic and oestrogenic substances is because of the failure to recognize the specific physiological disturbance in any individual before starting treatment. He has observed and treated 25 cases of functional amenorrhoea since 1933 and obtained a restoration of menstruation and a much improved regularity in 60 per cent of cases. All these women had menstruated prior to the onset of amenorrhoea and 18 of them had an absence of menstruation for periods of 6 months to 3 years. After each case had been examined to exclude any non-functional cause the author proceeded with an investigation of the basal metabolism and an analysis of the urine for gonadotropic and oestrogenic hormones. The most important question to be solved is whether the ovary is functioning or not, and Tamis says that this can be done by considering the history, by biopsy of the endometrium, and by urinary analysis. If it is proved that ovarian function has completely ceased and that the menopausal state exists all therapeutic efforts must fail. He found that the symptom of hot flushes did not always mean that ovarian function was completely dead. Following this investigation Tamis tested the efficiency of the other ductless glands, especially the thyroid and pituitary, and made a rough classification which he found most useful as a working basis for therapy and prognosis. Obesity was found to be commonly associated with amenorrhoea and differences in the fat deposition according to the gland or glands at fault could often be made out but it did not give any inkling as to ovarian function. Cases of hypothyroidism when treated with desiccated thyroid

extract and X-ray stimulation of the ovaries were the best type for a good therapeutic result. Female sex hormones were only advised in these cases when diminished ovarian function was present as well. Tamis also found that amniotin and follutein definitely improved the menstrual function when given in cases of poor ovarian follicular activity.

A Biological Test for the Diagnosis of Intra-uterine Foetal Death.

Because of the difficulty of diagnosing death of the foetus in early pregnancy Rezek has experimented with the Schneider modification of the Aschheim-Zondek reaction. He says it is superior to X-ray diagnosis as it can be used before the fifth month and gives a reaction in 24 to 48 hours after the death of the foetus. He says that the X-ray is only of value after the fifth month and then 4 to 5 days must be allowed to elapse after the death of the foetus before enough degeneration of cerebral tissue takes place to cause overlapping of the skull bones.

His technique is to take 10 c.c. of urine, to inject it into the vein of the ear of a virgin rabbit, 13 to 15 weeks old, and to kill the rabbit 40 to 48 hours later. If the ovaries are small and opaque they are too immature to show any reaction; if the ovaries contain one or more mature follicles but no haemorrhage the test is negative; if the follicles contain peripheral haemorrhage the test is positive. The test does not differentiate between a dead foetus and the retention of the products of conception. In cases of premature labour when the foetal heart could be heard, the author was unable to get a positive reaction, but 24 to 48 hours after the heart sounds had disappeared a positive reaction was obtained. The author does not agree with Jeffcoate that the reaction is brought about by the hormonal imbalance of an impending abortion but only by the death of the foetus, as it was negatve in premature labours with a living foetus. He is unable to state the causative factors of the reaction.

Carcinoma of the Body of the Uterus.

The authors review 279 cases and the 5-year end results of 211 cases. The youngest patient was aged 20 and the oldest 76 years, but the greatest number, 124, or 46.3 per cent, occurred between the ages of 50 and 59 years. They state that carcinoma of the body is often considered to be a post-menopausal disease, but 30.5 per cent of the cases occurred in the pre-menopausal age. One of the most important observations they made was that there appeared to be no special relation between the absence of child-bearing and this disease. Out of 223 patients who were married 150, 67.3 per cent, had had one or more full-time deliveries, 48, 21.5 per cent, were nulliparous, and in 25, 11.2 per cent, the parity was not known. Actually 33 patients, 16.7 per cent, had borne 5 children. As was to be expected, bleeding was the commonest symptom and first in 80.5 per cent of all cases. In the great majority it was of the intermenstrual type, and only in 6.8 per cent was menorrhagia alone the chief complaint. In those patients who were still menstruating the delay before seeking special advice was 22 months, whereas it was on an average of 16 months in those past the menopause. Actually only 43.8 per cent sought treatment before the end of 1 year and it was found that in the 96 cases in which the growth

was associated with fibroids the delay was increased on the average by nearly 4 months. The importance of histological examination of all curettings was well shown, as in 42 cases a malignant neoplasm was completely unsuspected and in 87 cases the diagnosis was entirely dependent on the microscopic findings. The authors also proved how important it is always to inspect the endometrium before closing the abdomen when subtotal hysterectomy has been performed.

On analysing the end-results the author divides the cases into two main groups (*a*) those treated by hysterectomy, and (*b*) those treated by radium. The operative mortality-rates were 4.3 per cent and 2.2 per cent respectively. The 5 deaths following hysterectomy were all due to peritonitis, and of the 2 deaths with radium 1 died of cardiac failure and the other of peritonitis. The total 5-year salvage was 94 cases, giving a rate of 44.5 per cent. When comparing the two methods of treatment very little difference was found in this 5-year estimation, the figures being 47.8 per cent and 43.8 per cent respectively. In his summing up the author states that child-bearing plays no part in the predisposition to corporeal carcinoma and that metrorrhagia is the most important symptom. He also believes that the treatment of choice in uncomplicated cases is total hysterectomy followed by deep X-ray therapy.

A Critical Study of the Low Cervical and Classical Caesarean Section Operations.

Because of the controversy concerning the relative merits of these two types of operation Falls has tried to give an impartial picture of the results of an analysis of a series of cases of both. For the last 10 years he has performed the operations alternately so that his series will be of value only for assessing the benefits of each method. He begins his paper with an account of the advantages claimed by the sponsors of each operation and then gives a detailed account of the steps of the two operations as performed by himself. In the classical operation he uses a continuous catgut suture for closing the deeper layer of the uterine muscle, while in the low segment operation he employs the vertical midline incision into the uterine cavity. Both these points in the technique of the operations are unusual in England.

In estimating the results of the two series he comes to the conclusion that there is very little in it. If anything, the low cervical operation gives rise to a slightly less degree of morbidity and to less post-operative vomiting or ileus. He thinks that both operations take about the same length of time to perform but that probably the classical operation would be the easier for those who have not had special experience of the other.

Bryan Jeaffreson.

Surgery, Gynecology and Obstetrics

Vol. lxv, No. 2, August 1937.

*Pregnancy complicating bone tumours. L. S. McGoogan.

Pregnancy Complicating Bone Tumours.

In the last few years 10 instances of tumours of bone complicating preg-

nancy have been observed, and these cases have been reviewed, in this communication, by the author.

As the material was assembled it divided itself into the following headings: (*a*) the effect of pregnancy upon neoplasms in general, (*b*) the effect of pregnancy upon bone metabolism, and (*c*) the effect of pregnancy upon bone tumour.

Emge has reviewed the first of these subheadings, and he concluded that the growth of neoplastic tissue will be affected by a pregnancy only as that tissue is affected by the local and remote bodily changes incident to pregnancy.

The whole subject of normal bone metabolism with its underlying physiochemical processes is not completely known, but after discussing this in great detail, the author concludes that bone metabolism is altered by pregnancy. Locally the bones are depleted of their calcium-phosphate complex by normal and altered metabolic processes, the foetus using the available supply before the mother's needs can be supplied.

Lastly, with regard to bone tumours, there is little definite information, but one gains the opinion that pregnancy has little if any effect upon the rate of growth of the tumour.

The 10 cases are reported here, and the treatment fully discussed.

Charles D. Read.

The Biochemical Journal.

Vol. xxxi, No. 3.

*Prolonged treatment of castrated and ovariectomized rats with testosterone. v. Korenchevsky, M. Dennison, and M. Eldridge.

Vol. xxxi, No. 4.

Relative duration of the action of various esters of oestrone, oestradiol and oestiol. A. S. Parkes.

PROLONGED TREATMENT OF CASTRATED AND OVARIECTOMIZED RATS WITH TESTOSTERONE.

Experiments are recorded of the activity of the male sex hormone, testosterone proprionate, on castrated male and spayed female rats. It was found that in the male rats, the male sex hormone produced a complete recovery to normal in the atrophied sexual organs. In the females a stimulating effect was noticed. The female urethra, under the influence of the male sex hormone became hypertrophied, and developed into a structure resembling a clitoris.

J. Moore.

Journal of Hygiene

Vol. lxxxvii, No. 1.

*Fertility and its relation to social conditions. K. Mitra.

Vol. lxxxvii, No. 2.

*Studies in the declining birth-rate in Middlesex and London. W. J. Martin.

FERTILITY AND ITS RELATION TO SOCIAL CONDITIONS.

The author has repeated a survey of vital statistics for London from 1930 to 1932. He confirms the findings of Dr. Heron in 1901. He shows that the fertility has declined more amongst citizens possessing "qualities advantageous to the state," than amongst the "socially less desirable" persons.

BIRTH-RATE IN LONDON AND MIDDLESEX.

Considerable variations in fertility in different sections of the London area are found. As a whole in London the birth-rate has fallen by 56 per cent since 1870. A higher birth-rate is recorded in areas with a large proportion of unskilled or semi-skilled manual workers as residents. A lower birth-rate is seen in areas in which a higher proportion of professional and affluent persons reside. Consideration of other indices of relative poverty, wealth, and hygienic conditions gives a similar answer.

J. Moore.

Journal of State Medicine

Vol. xlv, No. 5, 1937.

*Venereal disease in women. Surg. Lieut.-Commander R. Schofield.

Vol. xlv, No. 8.

*Infant feeding in warm climates. Robert J. Blackham.

VENEREAL DISEASE IN WOMEN.

The origin of venereal warts is doubtful. A possible causal factor may be a distinct virus, and that gonorrhoeal infection is not necessary for their development. Moisture, irritation, and lack of cleanliness also play a part in their development. Hyperaemia of the tissues may be a factor, as in several cases of pregnancy luxuriant outcrops of warts have been noticed.

Six cases of venereal warts in young patients are reported. Three of the 6 patients were pregnant. Gonorrhoea was only proved in 1 case, but 4 of them were clinically suggestive of infection. The remaining 2 were clinically and pathologically negative. These results are evidence that the presence of venereal warts depends on other factors apart from the actual gonorrhoeal infection, which is frequently not found.

J. Moore.

INFANT FEEDING IN WARM CLIMATES.

In this connexion Dr. Blackham deals with the problem of infant feeding in tropical countries. He points out the difficulties of breast feeding

amongst European and native mothers, and the impossibility of obtaining, even under the best conditions, high grade clean cow's milk. The greater part of the paper is confined to giving practical advice on artificial feeding. After discussing, at some length, the advantages and disadvantages of condensed and dried milks, he comes to the conclusion that the condensed milks are the better, both from the dietetic and economic points of view.

Two tables for feeding with condensed milk are included for reference, one according to Radaux, and the other taken from Paterson and Forest Smith.

B.E.

The Journal of Physiology.

Vol. lxxxix, No. 3.

*The sensitivity of the cervix to oxytoxin. W. H. Newton.

THE SENSITIVITY OF THE CERVIX TO OXYTOXIN.

Experiments are described to show that in the rat and guinea-pig, in any stage of sexual activity, the cervix uteri does not react *in vitro* to large doses of pitocin.

J. Moore.

La Gynecologie.

July 1937.

*The diagnosis of carcinoma of the body of the uterus. P. Moulonguet and L. Gasne.

*The surgical treatment of carcinoma of the body of the uterus. Paul Funck-Bretano.

The diagnosis of carcinoma of the body of the uterus. E. Douay.

Radium therapy of carcinoma of the body of the uterus. M. Oppert.

THE DIAGNOSIS OF CARCINOMA OF THE BODY OF THE UTERUS.

The authors suggest that the diagnosis of carcinoma of the cervix is often stressed and the diagnosis of other types of carcinoma of the uterus neglected. The diagnosis of cancer of the body can present real difficulties, and is a very important gynaecological problem.

Statistics give the incidence of carcinoma of the body in post-menopausal haemorrhages from 33 per cent to 67 per cent.

Non-cancerous bleeding may be due to medical causes, to senile endometritis, sometimes with pyometra. When pyometra is present there is a purulent discharge. Sometmes polypi are associated with pyometra. In old patients with genital prolapse polypi occur and cause bleeding.

The most difficult diagnosis occurs in cases of post-menopausal bleeding caused by an ovarian tumour. In cases with large fibromata of the ovary or large malignant ovarian growths the diagnosis is easy; but sometimes smaller growths are difficult to diagnose. Granulosa-cell tumours are very interesting, and, having a hormonic action similar to an active ovary, they produce menstrual bleeding. They may be very small tumours and difficult to palpate.

It is difficult to explain the bleeding accompanying other ovarian bleeding, such as that due to secondary malignant ovarian growths or fibromata. It may be due to interference with the pelvic nervous plexus.

Thus cancer of the body may be simulated by ovarian lesions, benign or malignant, of an endocrine nature or otherwise.

Metrorrhagia occurring before the menopause may be due to cancer of the body, and, according to Claude Beclere is present in 8 per cent of the cases.

Two lesions such as uterine fibroids and cancer of the uterine body may exist together, and this fact must be kept in mind when treating a fibroid with a sterilizing dose of radium. The author also suggests that when subtotal hysterectomy is performed for fibroids, the cavity of the uterus should be opened at the operation. They also suggest that X-ray sterilization should be preceded by hysterography or, better still, by curettage. They stress the use of curettage before radium or X-ray therapy.

Hyperplasia of the endometrium occurs in two-thirds of the women over 40. By histological examination, however, it is easy to differentiate hyperplasia from cancer.

Another problem is when a carcinoma of the body co-exists with a mucous polypus. It is always advisable to curette when removing such a polypus.

Cancer involving the whole of the uterus may originate in the cervix or in the body. The corporeal type does not answer well to radium treatment, and when it involves the whole of the uterus, it is perhaps one of the best remaining indications for Wertheim's hysterectomy. So, in conclusion, the authors point out that curettage must be used whenever the diagnosis of carcinoma of the body may be suspected.

In younger women the possibility of cancer of the body must be kept in mind when therapeutic measures are being decided upon. Subtotal hysterectomy in these cases must always include opening the uterus during the operation. Before radium therapy is used in cases of fibroids cancer of the body must always be eliminated.

We must aim at greater precision in diagnosis, take great care when we decide on non-surgical therapy, and think always of the possibility of cancer of the body of the uterus.

Surgical Treatment of Cancer of the Body of the Uterus.

With the exception of a few contra-indications such as obesity and cardiac failure or local extensive growth, the author considers surgery the best way of treating carcinoma of the uterine body.

Three operations may be used, supra-vaginal hysterectomy, vaginal hysterectomy, and panhysterectomy. In choosing a method of treatment it is necessary to consider certain principles.

Cancer of the uterus occurs in older people, often the subjects of prolonged bleeding, and it is necessary to choose the anaesthetic carefully, the blood-pressure being the major determining factor between inhalation or spinal anaesthesia. Before operation every care is taken to try to determine the presence of secondary deposits or invasion of the parametrium. During the operation damage to a friable uterus must be avoided by careful

handling, and the septic contents of the uterus must not be allowed to spill.

Supra-vaginal hysterectomy has now been abandoned because of cervical extension, risk of peritoneal soiling, and poor drainage. So this operation is restricted to cases in which total extirpation is impossible; and radium should be used to complete the treatment.

Vaginal hysterectomy should be reserved for very obese patients. Rouffart (Marin) and Rouffart (Thiriar) and Violet have shown good results by this method. Together with P. Tixier, however, the author considers abdominal hysterectomy the method of choice.

Statistics by Donald and Fletcher Shaw, Reifer, Bisch, and from the Saltpetriere are quoted to show the age-incidence of this growth, which is mainly above 50 years.

In the operative technique the vagina is swabbed with iodine, and a clamp left in the vagina for pulling through a drainage tube at the end of the operation. A median sub-umbilical incision is made, and a Doyen retractor used. The uterus is held by clamps on the cornua, the pedicles tied, the vagina opened, and the uterus removed. A tube-gauze vaginal drain is inserted from above, and fixed to the vaginal vault by catgut sutures. The peritoneum is now closed with clean instruments and the abdomen sutured.

Published statistics as to the results of the operation show a marked difference. For instance, Winchel shows mortality nil, Döderlein 30.7 per cent, Bisch 10.6 per cent, and Saltpetriere 10 per cent. At Saltpetriere the 4 deaths were due to pulmonary embolus in 2 cases, septic peritonitis in 1 case, and cardiac failure in 1 case. A cure-rate of 65 per cent is claimed by Bisch.

In conclusion total hysterectomy is claimed to be the operation of choice, having an immediate mortality of 10 per cent and a very reasonable cure-rate.

Gynécologie et Obstétrique

Vol. xxv, No. 6, June 1937.

*The treatment of severe vomiting of pregnancy. J. Voron and H. Pigeaud.

Accidental injuries in gynaecology. G. Jeanneney and P. Derville.

*The relation between ovarian function and vitamin C. A. Giroud, R. Ratsimamanga, C. Leblond, and M. Rabinowica.

The nitrogen and polypeptide content of the blood in the puerperium. M. Rivière and Legrosdidier.

Hormone therapy in the treatment of the symptoms of the surgical menopause. J. Regad.

Vol. xxxvi, No. 1, July 1937.

*The results of trial labour over a period of 10 years. J. Rhenter, Bucher, and Chastel.

Galactorrhoea. Reeb.

The relation between the blood-proteins and water retention. E. Tonkes.

Ovarian endometriosis associated with a myoma of the appendix. L. Kulikowska.

A case of ovarian pregnancy. A. Ginglinger.

*The calcium and phosphorus content of the blood in pregnancy in working women. G. Ichok and G. Toussaint.

THE TREATMENT OF SEVERE VOMITING OF PREGNANCY.

The general measures recommended by the authors in all types of vomiting of pregnancy are isolation of the patient, appropriate psychological treatment, complete restriction of fluids by mouth for a day, replacement of fluid loss by subcutaneous saline, and the exhibition of general nervous sedatives. In addition they give eserine to those patients exhibiting undue sympathetic tonus, belladonna to those with vago-tonus characterized by a slow pulse-rate and salivation, and to mixed types they give injections of ergotamine tartrate (1 c.c. of a 1 in 2,000 solution).

In those patients in whom bilious vomiting is a marked symptom they employ an indwelling duodenal tube.

THE RELATION BETWEEN OVARIAN FUNCTION AND VITAMIN C.

Vitamin C or ascorbic acid reduces an acid solution of silver nitrate, and the deposition of granules of reduced silver in a tissue so treated may be taken as an index of the amount of vitamin C which is present. The authors confirm previous observations that the corpus luteum contains a much larger amount of the vitamin than the other components of the ovary. The vitamin content of the whole ovary varies with its functional activity and particularly with its degree of luteinization. The authors conclude that the secretion of progestin necessitates a high cellular content of ascorbic acid. On the other hand they find the vitamin content of the placenta is low.

An extensive bibliography of papers which deal with the relations between the sex hormones and vitamin C completes the paper.

THE RESULTS OF TRIAL LABOUR OVER A PERIOD OF 10 YEARS.

In 141 cases of trial labour there were 3 maternal deaths, from toxaemia, septicaemia and obstetric shock respectively, a mortality of 2.12 per cent; 20 infants died, a mortality of 14 per cent, compared with a general foetal mortality for the whole hospital of 4 per cent. In 60 per cent of the cases chosen for trial labour spontaneous delivery occurred with a living child. In the other 40 per cent the adoption of trial labour led to difficulties such as used to be the common experience of obstetricians before the days of antenatal supervision. In the author's opinion the general results of trial labour are little if at all better than those obtained by the induction of premature labour.

In his opinion the procedure should be reserved for two types of cases, patients with severe pelvic contraction in which the decision for or against Caesarean section can be made early in labour, and cases of slight contraction in which the previous obstetric history gives grounds for thinking that labour will be easier than the results of examination would suggest. He thinks that the indiscriminate adoption of trial labour may lead to a neglect of the study of exact pelvimetry.

THE CALCIUM AND PHOSPHORUS CONTENT OF THE BLOOD IN PREGNANCY IN WORKING WOMEN.

The authors have determined the blood calcium and phosphorus content in various classes of working women. Their results are as follows:

(1) Pregnant women who work for more than 8 hours a day have a low total of calcium and phosphorus content but a raised phosphorus content.

(2) The percentage of pregnant women with normal findings is lower in women working more than 8 hours a day than in those who have given up work or who work only for shorter periods.

(3) Machine workers and women with many children have a low phosphorus content.

(4) The occupations of the women with a low calcium and phosphorus content were shop assistants, domestic workers, factory workers, and workers in the chemical trades.

P. Malpas.

Bruxelles Médical.

Vol. xvii, No. 37, July 11th, 1937.

French Congress of Gynaecology. May 15th to 18th. Report of a discussion on carcinoma cervicis.

Vol. xvii, No. 38, July 18th, 1937.

*Hysterectomy following perforation of the uterus during curettage. J. Rouffart-Marin.

Vol. xvii, No. 39, July 25th, 1937.

*A case of chorion-epithelioma treated by radiotherapy. G. Melot.

Vol. xvii, No. 40, August 1st, 1937.

*Post-operative closure of the vagina during pregnancy. M. Brouha.

Vol. xvii, No. 41, August 8th, 1937.

*A new test for the early and differential diagnosis of pre-eclampsia. J. A. Schockaert and J. Lambillon.

Vol. xvii, No. 44, August 29th, 1937.

Two cases of congenital malformation of the heart in the newborn. J. A. Schockaert, J. Lambillon, and W. Reynaert.

Vol. xvii, No. 45, September 5th, 1937.

*Radiotherapy for adenocarcinoma cervicis. Hermann Wintz.

*Bacterial invasion of the amniotic sac during labour. Preliminary note. O. Gosselin.

HYSTERECTOMY FOLLOWING PERFORATION OF THE UTERUS DURING CURETTAGE.

Three weeks after her first confinement a woman developed uterine haemorrhage and pyrexia. During curettage the fundus uteri was perforated and the accident was immediately recognized.

When the patient was admitted to hospital there was evidence of peritoneal irritation, and exploration of the uterus revealed the presence of infected placental tissue. Subtotal hysterectomy under spinal anaesthesia was immediately performed; the peritoneal cavity was drained.

In discussing the case the author points out that whereas in most cases in which the uterus is perforated, no special treatment is required, hysterectomy is advisable if products of conception are retained. In curetting a recently pregnant uterus the use of a specially large, as well as blunt, curette is advocated.

A Case of Chorion-epithelioma Treated by Radiotherapy.

Chorion-epithelioma is characterized by its rapid dissemination, metastases occurring most commonly in the lungs, vagina, brain, liver, and bones. It may also occur in the male and invariably give rise to the formation of large quantities of gonadotropic hormone. The value of biological tests in diagnosing this neoplasm is discussed. Using the Zondek-Aschheim test, the finding of 100,000 mouse-units of hormone per litre is regarded as reasonably certain evidence of placental neoplastic change. The Friedman-Brouha test is also valuable but should be carried out on *young* rabbits: in such animals normal pregnancy urine will not give a positive reaction.

These tests are useful not only in diagnosis but as a means of estimating the degree of malignancy, the extent of the growth, and its response to treatment. Nevertheless, they are not conclusive and diagnostic curettage is usually necessary.

The author is sceptical as to the diagnosis of cases in which spontaneous cure has been recorded and emphasizes the occasional difficulty in histological diagnosis.

The reported results of total hysterectomy for this condition vary; 32 to 75 per cent of cures are claimed. The operative mortality is high because the patients are usually in poor general condition.

Radiological methods of treatment have been used for some time, particularly for those cases beyond the scope of surgery. Several cures have been reported but the technique employed has varied considerably.

A case is reported of a woman, aged 39 years, for whom hysterectomy for hydatidiform mole was performed. One month later a malignant nodule developed in the vagina. Radium was applied locally, and the pelvic organs were subsequently subjected to deep X-ray therapy. The nodule slowly disappeared, the Friedman test became negative, and the patient was well 16 months after the initial treatment.

Post-operative Closure of the Vagina during Pregnancy.

A multiparous patient, aged 35 years, developed vaginal prolapse at the third month of pregnancy and was treated by colporrhaphy and perineorrhaphy—the condition of pregnancy evidently escaping recognition.

She was seen by the writer at the fourth month of pregnancy and at that time the vagina was completely occluded. An expectant attitude was adopted and labour commenced prematurely at the seventh month. The vagina remained imperforate and a thick band of tissue separated the presenting part from the examining finger. Classical Caesarean section was

performed but the child died soon afterwards. From above, the upper part of the vagina was found to be dilated but no communication to the exterior was found. Subtotal hysterectomy was therefore carried out and the upper part of the vagina was packed with gauze. Dissection from below until the gauze was reached produced considerable bleeding which was ultimately controlled. The gauze was gradually withdrawn during three days but the vagina was re-closing when the patient left hospital.

A New Test for the Early and Differential Diagnosis of Pre-eclampsia.

The authors discuss the view that toxaemias of pregnancy are due to an excessive amount of posterior pituitary hormone and suggest that there is an imbalance between this hormone and an "antihormone". They have previously demonstrated the presence of a specific antagonizer to vasopressin in the blood of pregnant women approaching term.

The new test entails the intravenous injection of 3 units of the vasopressor fraction of posterior pituitary extract and noting the effect on the blood-pressure of a patient previously at rest.

Normal non-pregnant women respond to this substance by experiencing malaise, nausea, pallor and sometimes syncope. There is a temporary rise in blood-pressure (average equals 45 mm. Hg.). The pulse-rate is slowed.

Women in the last three months of normal pregnancy experience no subjective symptoms although they are pale. The rise in blood-pressure is very slight and is followed by a period of hypotension. The pulse-rate is accelerated.

In the puerperium this resistance to vasopressin is gradually lost and even on the second day reactions begin to be seen.

Patients suffering from pre-eclampsia respond to this test by showing an average rise in blood-pressure of 55 mm. Hg.; this rise persists for 15 minutes. The pulse-rate becomes slow but the subjective symptoms are not so pronounced as in non-pregnant patients. This reaction by toxaemic patients is interpreted as being due to a deficiency of the vasopressin antibody.

Pregnant women suffering from chronic nephritis or essential hyperpiesis behave like patients with uncomplicated pregnancy and show very little reaction.

The test is therefore a simple and rapid method of distinguishing this type of condition from true toxaemia.

The refractory phase commences about the third month of pregnancy. If the foetus dies but the placenta remains active the patient continues to show no reaction.

Although 3 patients in the series described developed eclamptic fits after the test, the authors consider that the test is without danger.

Radiotherapy for Adenocarcinoma Cervicis.

In spite of contrary views expressed by most workers, Wintz does not believe that the adenocarcinoma of the cervix is radio-resistant. The results of either surgery or radiotherapy are bad because this type of growth, being intracervical, is relatively late in giving rise to symptoms and it spreads rapidly via the lymphatics and even the blood-stream.

Of 67 cases of adenocarcinoma of the cervix, treated with radium, 40.3 per cent were cured at the end of 5 years. Of these 27 were originally classified as operable and of these 51.8 per cent were cured. The author attributes his excellent results to the fact that he uses massive dosage—25 per cent more than for squamous-cell growths. Both radium and deep X-rays are used and the whole dose must be given within 3 days. A small initial dose renders the growth incapable of response to further treatment.

This massive dosage is not without danger and the patients invariably experience enteritis and tenesmus. Nevertheless, the results are better than those obtained by surgical procedures.

BACTERIAL INVASION OF THE AMNIOTIC SAC DURING LABOUR. PRELIMINARY NOTE.

Owing to possible contamination it is almost impossible to investigate this problem by the vaginal approach or even at Caesarean section. The author therefore practised intra-uterine puncture via the abdominal wall. Having emptied the bladder a needle is inserted into the uterus at the height of the umbilicus on the side of the foetal limbs. Amniotic fluid is withdrawn into a syringe and examined bacteriologically. The method has another advantage in that it can be repeated on the same patient and the process of bacterial invasion followed.

In 45 cases the membranes were intact and labour had not progressed for more than 12 hours. In one case in which the foetus was macerated, staphylococci were found in the fluid: in the remaining cases it was sterile.

The results of examinations carried out after the rupture of the membranes are recorded, and it is concluded that bacterial invasion depends not on the length of labour, but on the duration of labour after the membranes have ruptured. After 24 hours had elapsed bacteria were recovered from the uterus in every case.

The organisms found in the amniotic cavity were identical in many instances with those recovered from the vagina, and the author concludes that the uterine infection is of the ascending type.

J. N. A. Jeffcoate.

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Experimental studies concerning the effect of a protein and fat-rich diet on hepatic function during pregnancy. G. Effkemann.

The structure of the female urethra. E. N. Petrowa, C. S. Karaewa, and A. E. Berkowskaja.

The significance of hereditary factors (family histories) in the origin of hypertonia, especially essential hypertonia of pregnancy. G. Tsutsulopulos.

*Clinical studies and studies in the pathological anatomy of the thyroid gland at birth. H. O. Neumann.

*Clinical and pathological studies concerning thyroid hypofunction and female sexual function. H. O. Neumann.

*Pregnancy toxicoses and tumours. G. v. Bud.

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*Radiotherapy of cervical carcinoma: a therapeutic and statistical annual report. F. Hesse.
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*Gold and vaccine treatment of genital and intestinal actinomycosis. Z. v. Szathmáry.
*Morphological and functional peculiarities of so-called ovarian struma. H. O. Neumann.
The value of short-wave therapy in the treatment of inflammatory conditions within the pelvis. J. Ottó.
The significance of the hypophysis in the commencement of the climacteric. E. Engelhart and H. Haüsler.
*Studies concerning the inhibitory effect of sodium chloride on the development and function of the female sexual organs. W. Klodt.
*The relations of the follicular hormone to pathophysiological conditions of growth in the breast: Part IV. Inhibitory effect of the corpus luteum hormone on mastopathia cystica produced by follicular hormone. L. Herold and G. Effkemann.

CLINICAL STUDIES AND STUDIES IN THE PATHOLOGICAL ANATOMY OF THE THYROID GLAND AT BIRTH.

Hesse has recently been recognized as a region in which goitre is endemic. Working there, Neumann has weighed and examined the thyroids of 133 stillborn children, and finds the average weight 4.14 gm. as compared with an average of 1.1 to 3.0 gm. in non-goitrous countries. Regarding 3 gm. as the upper normal limit, he found goitres in the newborn to number 35 per cent: medium-sized, up to 9 gm., and large goitres, 9 to 23 gm., in 26 and 9 per cent respectively. Examined microscopically the non-goitrous thyroids of the newborn showed hyperaemia and departures from the adult type in that colloid was practically absent, and many follicles exhibited epithelial proliferation and desquamation: the goitrous glands gave the typical picture of diffuse parenchymatous struma with telangiectases. The interpretation to which Neumann inclines is that while the appearances of the newborn thyroid fall within the group of gestational alterations of foetal organs and remain within physiological limits, those of congenital goitre are due to increased function, which seeks to compensate for iodine deficiency, or some other noxious factor. The physiological changes suggest that the placenta may contain thyreotype (hypophyseal) hormone. Enlargement of the foetal thyroid has been recognized as favouring defective flexion of the head during labour: in Neumann's series the proportions of deflexion presentations were 1:7, 1:5 and 1:3 respectively in non-goitrous foetus and those with small and large goitres. In 9 of the 133 cases pressure on

the trachea by a large goitre was concluded, by a process of exclusion, to have caused stillbirth.

Clinical and Pathological Studies Concerning Thyroid Hypofunction and Female Sexual Function.

Neumann reviews the results of experimental thyroidectomy in young and mature animals, and concludes that the variable effects on sexual functions, at the time puzzling, are more easily explicable since the regulating function of the pituitary has been known. The inhibitory effects of thyroid hormone on the antuitary, and the increase of antithyroid protective substances in the blood of thyroidectomized animals must in addition be borne in mind, and much has yet to be learnt about the reciprocal effects of the endocrine glands. Neumann describes a case of cachexia thyropriva in a girl aged 21, whose goitre had been removed 9 years previously: the internal and external genitalia were infantile and hypoplastic, but menstruation, beginning at the age of 17 years, was regular, lasting for 2 or 3 days every 4 to 6 weeks. In 8 cases of myxoedema, the ages being 14 to 32 years, the genitalia were infantile: when the onset of puberty could be ascertained it was at 13 to 17 years. In 5 cases menstruation was regular at intervals of 28 days, being of normal amount in 2, increased in 2, and diminished in 1. The patient aged 14 years had not menstruated: in the one aged 32 years microscopical examination showed that the ovaries contained only a few follicles but had not ceased to function, for one contained a corpus luteum. Of 6 patients, aged 19 to 57 years, with cretinism 2 had infantile and 2 hypoplastic internal genital organs: one had a large necrotic myoma, another a sarcoma of the uterus. All had menstruated, from 12 to 17 years onwards; 3 had regular cycles of 28 days. Not one of these patients had been pregnant.

Pregnancy Toxicoses and Tumours.

v. Bud returns to consideration of the remote effects of local septic foci. He believes that pregnancy toxicoses are due not to specific but to focal toxins, and is convinced that he has seen the former cured by removal of the latter. From study of eclampsia without convulsions and of ileus and pyelitis in pregnancy with their paralytic atonia, and from clinical experience he is convinced that the basis of puerperal fever is found in an altered condition of the nervous system consequent on focal sepsis. Similar explanations are valid, he believes, for morbid conditions of the ovum and placenta, and congenital morbid conditions and the morbid constitution in general. Having observed benign and malignant tumours following conditions of nervous excitation or paresis (respectively in eclampsia, and in ileus and pyelitis) he suggests that toxic foci may produce in addition to such nervous effects trophic alterations leading to tumour formation. Four illustrative cases are described: (1) A combination of bilateral malignant ovarian tumours, pregnancy, acne, nephropathy, oedema and pre-eclampsia, (2) an asthenic patient with gastro-enteroptosis, dermatographism, positive v. Pirquet test, cystic ovarian degeneration and carcinoid of the appendix, who had pyelitis during pregnancy and gave birth to an infant with deformities and severe dermatological symptoms, (3) cavernous haemangioma of

the vulva at term in a woman who had had eclampsia during a previous pregnancy, (4) epulis following oedema, albuminuria and abortion. All had septic foci in the teeth and/or the tonsils. In the first 3 cases toxic influences on the splanchnic nerves are suggested to have formed one link in the chain of morbid events.

RADIOTHERAPY OF CERVICAL CARCINOMA: A THERAPEUTIC AND STATISTICAL ANNUAL REPORT.

Treatment at the Cecilienhaus in Berlin rejects (1) rigid dosage in favour of special adaptations to each individual case, (2) treatment by X-radiation alone, (3) ambulant radiotherapy. A comparison is made with the treatment of pulmonary tuberculosis by artificial pneumothorax and almost equally protracted treatment, it is said, may be called for and is justifiable in carcinoma of the cervix. Fractional radium-X-ray treatment, combined with general treatment, yields much more than intensive radium treatment. As a general rule radium is applied vaginally (3,000 to 3,500 mgh. in 2 or 3 sittings) and intracervically (2,000 to 2,500 mgh.), the latter through a mushroom-shaped appliance: X-radiation is given in fractional doses from large abdominal, sacral and perineal fields (25 r/m) together with deep therapy, 1,300 to 15 r. in 10 to 15 sittings. Much importance is attached to local after-treatment by chloramine irrigations and by tamponage with non-irritating ointments or oils; to prohibition of coitus; and to climatic and spa treatment. The biopsy is followed at once by electrocoagulation and application of radium. The primary mortality in 157 cases was 3.2 per cent: there were 4 cases of severe bleeding, 8 of pelvic peritonitis, 2 of pyometra, 11 of thrombosis, and 1 each of abscess of the pouch of Douglas, paranephritic abscess, septicaemia, and pyaemia: inoperable cases are included. Thrombosis accounted for 3 of the 5 fatalities. The total year's material was 202 cases, 45 being operated on: no fewer than 10.4 per cent had not attained the age of 35, and the majority were aged less than 50. Neglected cases numbered 59 per cent, blame being assigned to the patient, a general practitioner or a gynaecologist in 68, 29 and 3 per cent respectively: unjustified pessimism, regarding the prospects of treatment, on the part of the patient or physician played a considerable part.

VITAMIN C DEFICIENCY IN PREGNANCY.

This was estimated in 26 healthy subjects by the Jezler-Kapp method, and was found in 62.5 per cent of primigravidae and 70 per cent of multiparae: it was more intense in the latter. Observations made in known and constant conditions of nutrition suggested that during pregnancy the degree of deficit was very similar in multiparae and primigravidae.

THE ACTION OF FOLLICULAR HORMONE AND GONADOTROPIC HORMONES IN THE FEMALE.

Büttner mentions animal experiments which show that follicular hormone inhibits the gonadotropic activity of the antuitary, and to clear the disputed question of the existence of a similar effect in woman, examined the urinary antuitary hormone excretion before and after the administration of very large doses of progynon B oleosum, e.g., 50,000 mouse-units twice daily,

500,000 units in all. A definite inhibition was noted, from which the patient recovered completely but very slowly. In the second part of this paper Büttner reports the administration of gonadotropic hormone of the prolan type, either commercial preparations derived from pregnancy urine given intramuscularly, or as blood from pregnant patients given intravenously, to 23 women aged 19 to 51 years with follicular persistence and glandulocystic endometrial hyperplasia. In 17 evidence of corpus luteum formation was forthcoming, either from the type of bleeding after treatment or more often from microscopic determination of the endometrial phase. Pregnancy blood injection was the more effective treatment. The usual result was an initial slight diminution of bleeding, a gradual further decrease and a cessation about the sixth day of treatment: the artificially induced corpus luteum phase seldom lasted the normal fortnight. The observations are not conclusive concerning the later results, but Büttner feels that the percentage of primary successes is sufficiently high to justify repetition of chorial hormone treatment, in sufficiently high doses, in recurrences. His dosage was 300 to 450 c.c. of pregnancy blood; from 2,400 to 10,500 rat-units of prolan in 2 to 8 days; or a combination of the two. In his third section Büttner considers the effect of the gonadotropic hormones on the normally functioning ovary during sexual maturity: they were given in high doses 6 to 16 days before hysterectomy in those with practically regular menstrual cycles. The ovaries showed increased formation of luteal tissue, an approximation of the cyclical changes, a rejuvenation of granulosa-cells in old atretic follicles and a restitution of the theca interna in corpora lutea of the preceding cycle and in old atretic follicles: no increased degree of follicular atresia was noted. Three cases which permitted assessment of the sensitiveness of quiescent ovaries to gonadotropic hormones showed that in such patients "it is scarcely possible to select too high therapeutic doses". Treatment with gonadotropic hormones can only advance when larger amounts than 100 to 500 rat-units are used. As was previously the case with follicular hormone the crucial question is technical—that of purifying the hormonic preparations to such a degree that they can be tolerated in large doses without untoward effects.

PATHOLOGY AND SURGICAL TREATMENT OF PREMATURE PLACENTAL DETACHMENT WITH UTERO-PLACENTAL APOPLEXY.

After a review of statistics from various sources the conclusion is drawn that treatment of partial detachment should be obstetrical; and that of complete detachment, surgical. for vaginal delivery carries with it excessive risk of atonic after-bleeding and subsequent post-partum hysterectomy, if necessary, has a mortality of 88 per cent. Of surgical interventions vaginal Caesarean section has had a mortality of 45 per cent and is to be rejected; abdominal Caesarean section is the best, if done at the right time, the mortality being 16.1 per cent; pre-Caesarean section amputation has a mortality of 16.6 per cent; pre-Caesarean extirpation is more dangerous and Caesarean section followed by amputation or extirpation has a mortality of 35.3 per cent, chiefly from atonic bleeding. Early diagnosis and early laparotomy are desirable: an intact uterine wall justifies conservative measures, which are permissible also in some cases in which the myo-

metrium, although the site of haemorrhage, retains its contractility. Blood transfusion is an indispensable adjuvant to treatment and should be done even in the less severe cases.

GOLD AND VACCINE TREATMENT OF GENITAL AND INTESTINAL ACTINOMYCOSIS.

Only 2 cases have been encountered at the II Universitats-Frauenklinik in Budapest of actinomycosis of the female genital organs. The second of these, as well as one recently described by E. Neuber, was cured by Neuber's combined treatment by gold and a vaccine. Gold was given after operation as solganol B, 0.5 gr. during 3 weeks in intramuscular doses of 0.1 gr., and later for seven weeks: serum from a convalescent from actinomycosis was now injected, 20 c.c. in 2 doses. Thirteen weeks after operation menstruation reappeared: treatment was continued with ferrous iron, insulin, quartz lamp abdominal irradiations, and injections of Neuber's polyvalent actinomycosis vaccine, 0.1 c.c. being given intracutaneously, first of a 50-fold dilution, increasing gradually to 1.2 c.c. of undiluted vaccine intramuscularly.

MORPHOLOGICAL AND FUNCTIONAL PECULIARITIES OF SO-CALLED OVARIAN STRUMA.

Neumann in 15 years has encountered 8 cases of ovarian tumours containing thyroid tissue, in 5 as one constituent of a teratoma; in 2 constituting almost the whole of the tumour, so that bone, cartilage, squamous epithelial cysts, etc., were found only on careful microscopical examination. In the remaining case it was only possible to examine half the tumour: only thyroid tissue was found. Struma ovarii may give the microscopical picture of parenchymatous goitre, the trabecular or small-follicle form, or colloidal struma nodosa the large-follicle or papillary form. In one case Neumann found a suggestion of commencing thyroid epithelial functional activity. He believes all cases to be teratomata: the so-called pure struma has not been subjected to complete microscopical examination. The majority of the patients exhibit no signs of thyrotoxicosis: these have been noted, however, in 5 or 6 cases in the literature, to which one is here added. The patient had some slight enlargement of the cervical thyroid: this, together with all signs of Graves's disease speedily disappeared after removal of the ovarian tumour, which weighed 880 grammes and in which the acini contained colloid. A pregnancy followed shortly after and went to term.

INHIBITORY EFFECTS OF SODIUM CHLORIDE ON THE DEVELOPMENT AND FUNCTION OF THE FEMALE SEXUAL ORGANS.

In experimental investigations concerning metabolic relations of sodium, chlorine, and water, Klodt noted that mice given large amounts of salt became sterile. Systematic investigations have now confirmed the inhibitory action of sodium chloride on the genital development of infantile animals and the production of sterility, which, however, is accompanied by morphological changes, in the fully developed subject. Development and function of the male genital organs did not appear to be affected. It is concluded that the action of the gonadotropic antuitary hormone is inhibited by sodium, and in the treatment of human sterility of unknown causation

the exhibition of a salt-poor diet, or the administration of ions antagonistic to sodium is recommended.

INHIBITORY EFFECT OF THE CORPUS LUTEUM HORMONE ON MASTOPATHIA CYSTICA PRODUCED BY FOLLICULAR HORMONE.

Herold and Effkemann have previously shown that in castrated female and male rats large doses of follicular hormone induced fibrocystic disease of the breast. They now find that the exhibition of corpus luteum hormone causes regression of this experimental mastopathy: its production may be prevented by the administration of corpus luteum hormone with the follicular hormone.

W. E. Crowther.

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*Pregnancy after tubal sterilization. K. W. Schultze.
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*Spontaneous cure of secondary amenorrhoea of long standing. M. Rodecurt.
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The operative treatment of urinary incontinence in the female. V. Schrattenbach.
A new urinal for the female. V. Föderi.

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*A case of vaginal melanoma. E. Tscherne.

The lactogenic action of the hypophysis upon normal, pregnant, and lactating animals. M. Wiegand.

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The problem of the suprarenal cortex in pregnancy. J. Novak.

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The treatment of anal fistulae by short-wave therapy. W. Baumgart.

The effect of sexual hormones on the oviducts of the female bitterling (small carp species). E. Marcus.

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The question of traumatic cervical perforation in hysterosalpingography. H. Nölle.

Functional anterior pituitary insufficiency as a cause of habitual abortion. A. C. Kunz.

*Damage to the ovum with particularly widespread changes in the skeletal system following radiation. H. Goecke.

The colonization of the artificially formed vagina with Döderlein's bacillus. I. Györffy.

*The occurrence and treatment of colpitis vetularum. A. Szarka.

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Mastitis and the power of lactation. J. Klahn.

The use of Delmas's *accouchement forcé* in the treatment of placenta praevia. C. Holtermann.

*The treatment of spontaneous and therapeutic abortion. L. Windner.

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The premature separation of the normally situated placenta and uteroplacental apoplexy. E. Puppel.

*A simple operative procedure to control uterine prolapse in old women. H. Kahr.

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Findings with the drug thymuitrin of Richter. K. Zinram.

Late results of treatment with progynon for pruritus vulvae. M. Rodecurt.

Crédé's prophylaxis with argolaval. J. Ufer.
Clinical findings with temagin. A. Schweisz.

PREGNANCY AFTER TUBAL STERILIZATION.

Schultze reviews the methods which have been adopted to destroy tubal permeability and, as a result, he is definitely against any method which relies upon ligature or crushing of the Fallopian tubes. He has traced 32 cases recorded in the literature in which pregnancy has followed tubal sterilization. In addition he records 5 cases which have come under his own observation; 2 of these were investigated microscopically. In one of these two latter cases the patient had been treated by the Madlener crushing method; but the round ligaments had been treated instead of the Fallopian tubes. In the other, after excision of the isthmus of the tube, a fistula had formed leaving a track for the access of spermatozoa to the ovum. In the fistulous track cells, resembling decidual cells, were found; the writer suggests that the formation of decidua in this situation may have occurred as a result of hormonal influence.

SPONTANEOUS CURE OF SECONDARY AMENORRHOEA OF LONG STANDING.

Rodecurt refers to the work carried out by various investigators into the effect of ovarian hormone therapy upon long standing amenorrhoea, notably a case of E. Vogt which reacted favourably after 16 years.

The writer points out that it is possible for a patient to recover spontaneously without any hormonal therapy. He instances two cases in which spontaneous recovery occurred. In the first the patient was aged 42 years; after a delivery 19 years before she had had amenorrhoea until 3 months ago when her periods returned entirely normally. Physical examination could not demonstrate any abnormality. In the second case the patient was aged 41 years; amenorrhoea began 17 years before, following a confinement; she again became pregnant before her menses returned. After the second confinement menstruation returned regularly. It is to be observed that in both cases the amenorrhoea followed a delivery at term in women who were suffering the hardships of war-time deprivation and anxiety. While instancing these cases the writer is in entire agreement with the suggested hormonal treatment of amenorrhoea and sterility as a means of maintaining the population of his country.

A CASE OF VAGINAL MELANOMA.

Tscherne records the case of a patient of 62 years of age who developed a melanotic sarcoma in the posterior vaginal wall. The tumour was of the size of a walnut, dark in colour, and ulcerated on the surface. It did not appear to be adherent to the wall of the rectum. The patient had first become aware of its presence five months before her admission to the clinic at Graz.

The tumour was removed under a general anaesthetic with the greatest ease without any damage to the rectum and the immediate post-operative recovery was uneventful. At the time of the operation it was noticed that the vaginal mucosa in the neighbourhood of the tumour was of a darker

colour than normal. This darkening disappeared before the patient's discharge from hospital.

Histological examination showed the tumour to be a melanoma. At the time of her operation there were no signs of any other primary growth or of any metastasis but in view of the histological findings and the bad prognosis close observation was kept on the patient.

At the time of the patient's examination six months after operation she was very well and had put on 4 kilograms in weight. Nine months after her operation she had the first sign of a recurrence in the form of a small thickening near the left pelvic wall. In spite of X-ray therapy this swelling rapidly grew bigger and the patient died at home 7 months later. A post-mortem examination was not allowed. The writer points out that the occurrence of a primary melanoma in the vagina is unusual because normally the vagina is not pigmented. The writer saw no evidence that in his case the tumour had arisen in a naevus or resulted from pressure transfer from another site.

Damage to the Ovum with Particularly Widespread Changes in the Skeletal System following Radiation.

Goecke records the case of a woman, aged 44 years, with 4 healthy children, who was treated at the Munster University Clinic for fibroids. The fibroids had been known to be present since the birth of the first child 11 years before; at the time of admission they had reached the size of a foetal skull. Menstruation had recently been irregular and profuse, lasting for 8 days; her last period ended 8 days before admission. Radiation was carried from two abdominal fields and two dorsal fields, the dose over each field being 550 r., and the ovarian dose in each case being 230 r.

Amenorrhoea was complete after the irradiation which differed from the usual procedure at the clinic in that it was not preceded by curettage because she had once suffered from thrombophlebitis with pulmonary embolism. Some time later she was found to be pregnant and, six months later, she was delivered at term of a hydrocephalic female child after perforation of the after-coming head; the child was 45 centimetres long and weighed 2,570 grams.

This foetus was the subject of multiple skeletal deformities in addition to microphthalmia. All four extremities were deformed and the digits were in part missing. The left humerus had an intra-uterine fracture without any sign of callus formation. All the limbs appeared to be short in proportion to the trunk. There is a photograph of the foetus as well as an X-ray film of its skeleton. The writer ascribes all the defects of this foetus to the radiation to which it was subjected in early pregnancy.

The Occurrence and Treatment of Colpitis Vetularum.

Szarka reports on a series of cases of colpitis vetularum occurring in women after the natural menopause and following the early menopause after castration. In 80 such cases he treated the condition by the administration of follicular hormone and he gives a short report of the results of treatment. In addition he describes in detail one case with symptoms following total removal of the ovaries at 26 years of age, giving histological details of the

structure of the vaginal epithelium before and after treatment together with the exact dosage and duration of treatment.

From his experience the writer has come to the following conclusions. (1) By treatment with folliculin he was able to obtain complete cure in cases of colpitis vetularum. It therefore follows that defect of this hormone plays a part in the origin of this disease. (2) After folliculin therapy the cell content of the vaginal secretion is altered in a characteristic manner. To produce this result generally 50,000 international units of folliculin are required. That is to say that the human vaginal epithelium needs 50,000 units as against the endometrium which reacts to 300,000 units.

The Treatment of Spontaneous and Therapeutic Abortion.

Windner refers to the delay in the completion of inevitable abortions whether occurring spontaneously or following induction. To hasten evacuation of the products of conception and to minimize the amount of operative interference he waits in cases of spontaneous abortion till the cervix is dilated, or dilates it to number 14 Hegar. This degree of dilatation is followed by the intramuscular injection of 1 c.c. of thymophysin. In therapeutic abortion he starts dilatation by the insertion of laminaria tents for 24 hours; after their removal he immedately dilates the cervix to number 14 Hegar under a general anaesthetic and gives an intramuscular injection of 1 c.c. of thymophysin. In each case within 3 to 5 minutes of the injection the uterus has contracted down; the ovum has been separated and expelled so that it could be removed from the cervix in one piece by ovum-forceps.

He has found no contra-indication to this method of treatment nor to the injection of thymophysin. When the patient is not anaesthetized the uterine contractions are practically painless and when an anaesthetic is given the rapidity of the action of the injection greatly shortens its duration and the amount of bleeding is very slight.

A Simple Operative Procedure to Control Uterine Prolapse in Old Women.

Kahr describes an operation which he has evolved after experiment on the cadaver and tried on four living patients aged from 70 to 74 years. He has it carried out under local anaesthesia with 10 c.c. of a half per cent solution of novocain and adrenalin, the total time needed for the operation is about 15 minutes.

The operation consists in making a U-shaped skin incision in the groove between the labia majora and minora and across the fourchette. With either a knife or scissors the vaginal wall is separated from the deep tissues without opening its canal. A purse string suture is made round the freed vagina near its orifice and tied so that its external opening is narrowed to the calibre of a slate pencil and drawn forward to lie in the pubic angle. Next a series of mattress sutures are inserted into the carefully defined bulbo-cavernous muscles and tied after all are in position so that the inner edges of the muscles overlap. Finally the cut skin edges are united with silkworm gut sutures. The after treatment consists in the use of a self-retaining catheter for 3 or 4 days and lifting the patient out of bed on the second day after operation to obviate hypostatic pulmonary complications

The writer recognizes that this operation is only suitable for very old patients in whom there is no question of cohabitation, and for this reason no one operator will have the opportunity of performing it very frequently. He hopes it will be tried by others so that records of its success or failure may be obtained. He gives four very clear diagrams of the steps of the operation.

THE QUESTION OF IDENTIFICATION OF THE NEWBORN.

Kolb reports that in the University Clinic in Prag, where about 2,000 deliveries occur yearly, there had been no special means of identification of newborn infants nor any cases of mixing until an unfortunate occurrence which took place recently. The nurse who had interchanged two infants of similar appearance but different weights suspected what she had done on the evening of the same day and, instead of making an immediate report, made alterations in the weight charts of the infants. The mothers never questioned the identity of the babies handed to them by the nurse, and one child was discharged with the wrong mother eight days later. The birth weights of the infants were 2,800 grams and 2,400 grams, respectively. Eight days after the first infant and wrong mother had gone home the nurse, having a guilty conscience, confessed to the authorities, and a thorough investigation was undertaken; it was much hampered by the refusal of either mother to believe that she was caring for the wrong child. To avoid such a painful happening in the future the date of birth and birth weight are now written on a small oval piece of leucoplast (merckle) which is stuck on to the child's back at the level of the spine of the scapula in the sight of the mother immediately after its first bath. The leucoplast is easy to write on in ink or pencil, and such writing remains distinct for the whole of the infant's stay in hospital. The plaster remains adherent but does not cuase any soreness of the child's skin.

R. H. B. Adamson.

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*Caesarean section at the Women's Clinic, Göttingen. H. Martins.

July 9th, 1937.

*Three years' experience of the diagnosis of cancer with the colposcope. H. Hinselmann.

July 16th, 1937.

The treatment of depressional states associated with menstruation by alkalies. W. Braun.

July 23rd, 1937.

Variation in the rate of spread of uterine carcinoma. A. Mayer.

July 30th, 1937.

*Blood transfusion in obstetrics and gynaecology. M. Tausch.

CAESAREAN SECTION AT THE WOMEN'S CLINIC, GÖTTINGEN.

The article is devoted to the history of the Caesarean operation at the University Hospital, Göttingen, the records of the operation dating back to 1763. The first operations, as might be expected at that date, were fatal. it was only in the period 1888 to 1909 that the mortality fell to 20 per cent.

An analysis of cases operated on between 1926 and 1936 is also given. Out of a total of 8,786 births Caesarean section was done in 375 cases, or 4.3 per cent. The indications were chiefly contracted pelvis, ante-partum haemorrhage, developing or actual eclampsia, and a group of miscellaneous indications. The gross mortality was 5 per cent. Curiously the mortality was least, nil out of 64 cases, in ante-partum haemorrhage; the greatest mortality, 11.6 per cent, was in the eclamptic group. In contrast to the excellent results in placenta praevia the author states that in the same period 29 cases were treated by podalic version with the loss of 6 mothers and 12 children.

The mortality was 7.2 per cent in the group of miscellaneous indications but as this section includes cases of uterine rupture, haemorrhage from duodenal ulcer, etc., it is not surprising.

The corrected mortality rates in the contracted pelvis series showed a difference of 1.5 per cent of deaths in clean cases and 5.4 per cent in infected or potentially infected cases.

There are no statistics given as to the relative uses of the classical or lower segment operations.

THREE YEARS' EXPERIENCE OF THE DIAGNOSIS OF CANCER WITH THE COLPOSCOPE.

Prof. Hinselmann writes an interesting account of his experience during the last three years in the early diagnosis of cervical cancer by means of his special colposcope which magnifies the cervix to about 10½ diameter. The author is not specially interested in manifest cases of cancer with clinical signs, but only in those cases with latent carcinoma or the early ulcerated cases as yet without symptoms. Some difficulty has been found in getting the right type of patient to attend, as the author has had many cases sent of the easily diagnosed type which are not of use from the point of view of the prevention of cancer. The diagnosis is based on Hinselmann's belief that the carcinoma starts on the surface from the upper layers of epithelium and not growing from the lower layer only without any surface change. The result is that even in early cases some visible change is present. There are three main types of early lesion clinically, (1) those which can be detected by careful ordinary clinical examination; (2) the very early ulcerated stage which shows itself in suspicious red raw surfaces; (3) the rare type of small multiple carcinomatous foci.

Out of 1,133 cases examined during 3 years and 4 months the author has found 16 cases with very early carcinoma and expresses the hope that with increasing interest more cases will be found in this stage.

BLOOD TRANSFUSION IN OBSTETRICS AND GYNAECOLOGY.

Of recent years, since the blood-group system has been worked out, increasing indications and uses have been found for blood transfusions. In

the author's opinion the important contra-indications are serious organic disease of the heart or vascular system, of the liver and of the kidney. It is also important to take special care in serious cases of anaemia which may need transfusion at the menstrual periods. For dosage about 1,000 c.c. are necessary in acute anaemic conditions for blood loss, 300 to 500 c.c. in most other conditions.

The main indications are discussed, in addition to the usual indications such as haemorrhage of ante-partum or post-partum types, or prior to operation; the author is impressed by results in cases of sepsis and also in cases of excessive bleeding during menstruation at age of puberty.

Acta Obstetricia et Gynecologica Scandinavica.

Vol. xvii, Supplement 1.

*League of Nations Health Organization: Annual report on the results of radiotherapy in cancer of the uterine cervix. First volume. Statement of results obtained in 1930 and previous years (collated in 1936). Edited by J. Heyman, M.D., Stockholm.

LEAGUE OF NATIONS HEALTH ORGANIZATION: ANNUAL REPORT ON THE RESULTS OF RADIOTHERAPY IN CANCER OF THE UTERINE CERVIX.

The Health Section of the League of Nations set up a Radiological Subcommission of the Cancer Commission which initiated an enquiry into the results of radiation therapy of cancer of the cervix.

An Advisory Committee of Dr. J. Heyman, Radiumhemmet, Stockholm, as Chairman, and Dr. A. Lacassagne, Radium Institute of the University, Paris, and Lieut.-Col. A. B. Smallman, Ministry of Health, London, as members, with Dr. M. D. Mackenzie, replaced in July 1936 by Dr. J. Wasserberg, of the Health Section of the League of Nations Secretariat, Geneva, as Secretary, was formed.

The Advisory Committee was empowered to invite the collaboration of any institutes or individuals throughout the world provided their statements were considered suitable for inclusion in the annual reports.

The Committee drew up careful notes for the guidance of collaborators who were to report only on cases of carcinoma of the cervix uteri, including carcinoma of the stump. Statements should be confined to cases in which the treatment planned was entirely radiological (radium or Roentgen rays). Patients operated on after the failure of radiological treatment and alive 5 years after the beginning of the treatment should appear in Table 4, column 4.

The following cases should be excluded: (*a*) Cancer of the corpus uteri and vagina, (*b*) recurrence after radical operation, (*c*) patients radiologically treated elsewhere, and (*d*) patients primarily submitted to combined operative and radiological treatment.

Only cases in which the clinical diagnosis has been microscopically confirmed can, as a rule, be accepted. Precancerous conditions, chorion-epithelioma, sarcoma, and malignant mixed tumours should be excluded.

The statement should include all cases, the radiological treatment of which was begun during the year to which the statement refers as well as all patients examined with a view to treatment and not treated. The statement should not be completed until a period of observation of at least 5 years from the beginning of treatment has expired in all cases included.

Tables 1 to 6 are intended for the annual statements beginning with 1935, i.e. cases treated in 1930; Tables 7 to 10 are intended for those institutes which are able to furnish data for an earlier period similar to that adopted in the present series. Specimen tables are supplied for the guidance of collaborators as follows: Table 1: total number of patients examined subdivided into cases not treated and treated. Table 2: patients examined at the clinic but not treated, with 8 subdivisions giving the reasons for non-treatment. Table 3: patients treated: (*a*) total number; (*b*) with microscopic verification; (*c*) without microscopic verification. Table 4: results of treatment after a period of observation of 5 years, dating from the beginning of treatment. Cases are grouped according to the stage of the disease with a final group for all stages, and then classified under the headings of (1) number of patients treated; (2) alive without recurrence. (3) alive with recurrence; (4) patients alive operated upon after failure of radiotherapy; (5) died of cancer (patients dying during, or as a result of treatment, are included here); (6) lost sight of; (7) died of intercurrent disease. Table 5: absolute cure-rate, giving the total number of cases (Table 1); those alive without recurrence 5 years after the beginning of treatment (Table 4, column 2, stages 1 to 4). Table 6: relative cure-rate for patients at each stage and for total of all stages. Table 7: for cases treated in previous years, giving year, number of cases examined, number not treated, with a separate column for each stage and one for all stages. Table 8: results of treatment. Table 9: stages 1 to 4; evaluation of results. Table 10: stage 1; evaluation of results.

The report gives a section on the definition of the different varieties of utero-vaginal carcinoma. It gives some guidance to the reporters as to which cases should be brought within the scope of the inquiry and which should be excluded on the ground of having arisen in organs other than the cervix.

A definition of the stages of cancer of the cervix is given. To this is added a note that it is recognized that different clinicians interpret the rules for grouping the stages differently, and hopes are entertained that uniformity of grouping may eventually be obtained. The stages are defined as follows: (1) The growth is strictly limited to the cervix; the uterus is mobile. (2) Lesion spreading into one or more fornices with, or without, infiltration of the parametrium adjacent to the uterus, the uterus retaining some degree of mobility. (3): (*a*) Nodular infiltration of the parametria on one, or both, sides extending to the wall of the pelvis, with limited mobility of the uterus, or massive infiltration of one parametrium with fixation of the uterus; (*b*) more or less superficial infiltration of a large part of the vagina, with a mobile uterus; (*c*) isolated metastases in the pelvic glands, with a relatively small primary growth; (*d*) isolated metastases in the lower part of the vagina. (Generally all cases not falling into stages 2 or 4 will be placed in stage 3.) (4): (*a*) Cases with massive infiltration of both parametria extending to the wall of the pelvis; (*b*) carcinoma involving the bladder, or rectum; (*c*) the whole vagina infiltrated (rigid vaginal passage), or one vaginal wall infiltrated

along its whole length with fixation of the primary growth; (*d*) remote metastases.

The report furnishes detailed statements from the following centres:

Centre des Tumeurs de l'Université de Bruxelles, Belgium, contributed by Professor J. Murdoch. Ninety-four patients were examined, with 14 patients alive without recurrence. The absolute cure-rate was 14.9 per cent.

The Liverpool Radium Institute, England, contributed by Dr. P. Malpas. Ninety-two patients were examined, with 25 patients alive without recurrence. The absolute cure-rate was not given, because this clinic was not solely responsible for the treatment of cervical cancer in the area.

The Marie Curie Hospital, London, contributed by Dr. Elizabeth Hurdon. One hundred and forty-two patients were examined, with 56 patients alive without recurrence. The absolute cure-rate was 39.4 per cent.

Radium Centre for Carcinoma of the Uterus, London County Council, contributed by Sir Comyns Berkeley. Sixty-six patients were examined, with 10 patients alive without recurrence. The absolute cure-rate was 15.2 per cent.

Institut du Radium de l'Université de Paris, France, contributed by Dr. A. Lacassagne. One hundred and fifty-eight patients were examined (with 47 not treated for various reasons). Of the 111 patients treated, 52 were alive without recurrence, but as the available facilities at the Institut du Radium are not sufficient for the treatment of all patients presenting themselves, they are referred to other anti-cancer centres. The absolute cure-rate is not calculated.

Radiumhemmet, Stockholm, contributed by Dr. J. Heyman. Two hundred and five patients were examined, with 50 patients alive without recurrence. The absolute cure-rate was 24.4 per cent.

In addition the clinics in Bruxelles give records of patients examined during the years 1926 to 1929 (inclusive), in Liverpool for the year 1929, the Marie Curie Hospital for the years 1925 to 1929, the London County Council Centre for the years 1928 and 1929, Paris for the years 1919 to 1929, and Stockholm for the years 1914 to 1929.

R. H. B. Adamson.

Boletin de la Sociedad de Obstetricia y Ginecologia de Buenos Aires

Vol. xvi, No. 2, May 12th, 1937.

*A case of haemorrhagic breast. Viriot and Barbet.

*Lateral haematometra and haematosalpinx in a case of double uterus. Arenas and Echegaray.

*Incipient uterine adenomyosis, miliary in form. Jürgens.

Seminoma or disgerminoma of the ovary. Bazterrica and Suarez.

A Case of Haemorrhagic Breast.

The author describes a case of spontaneous intermittent haemorrhage from one breast. The patient, a nullipara, aged 36 years, said that for 9 months before admission to hospital there had been oozing of blood and blood-stained fluid from the right nipple, without pain or enlargement of the breast. On examination it was found that on pressure there was sero-sanguinous discharge from the right nipple and always from one and the same galactiferous duct. There were no enlarged axillary glands on either side. The absence of a palpable tumour warranted the exclusion of mammary carcinoma, adenoma or cystic disease (Réclus). The diagnosis lay between incipient carcinoma of a duct or an intra-canaliculus papilloma imperceptible to palpation. The age, history, and general condition of the patient favoured the latter conclusion. The breast was amputated subcutaneously. Macroscopic and histological examination confirmed the latter diagnosis. A papilloma with a wide pedicle was adherent to the wall of the dilated duct. An illustration is given of the histological appearance of the tumour; malignant change is not seen. Effected with care, the operation described leaves the operated breast similar in appearance to the other.

Previous examination of the sero-sanguinous fluid was no aid to diagnosis, as no elements were found save erythrocytes and leucocytes. Transillumination of the breast was of doubtful value.

Lateral Haematometra and Haematosalpinx in a Case of Double Uterus.

Lateral haematometra is of somewhat rare occurrence and its complication by haematosalpinx is even less frequent. In general it is associated with double uterus but has been observed in other types of malformation, such as bicornute uterus, accessory or rudimentary cornua.

The authors describe a case in which the patient was a girl of 13 whose trouble began at puberty at the age of 12 years with sudden and extremely painful menstruation. The pain increased at each period; appendicitis had been diagnosed, but the authors found tenderness and pain more marked over the right ovarian region.

A provisional diagnosis of ovarian cyst with torsion of the pedicle was made, and immediate operation carried out. The right Fallopian tube was found bent, enormously dilated, inflamed, and adherent to the broad ligament, the base of the pouch of Douglas, the sigmoid colon, and the rectum. Separating adhesions with difficulty they found the right ovary normal. The left Fallopian tube was slightly inflamed. The uterus had two bodies each with a round ligament and corresponding adnexa. The right uterine body was normal in size and thrice as big as the left.

Right salpingectomy was performed as a preliminary operation, so that when further measures might be taken when the patient was in better health and her genital abnormality could be better studied. For two months menstruation was almost normal, then new dysmenorrhoeic crises appeared and the patient returned to hospital.

The second operation, total hysterectomy of the right uterus, was then

carried out. The left uterus and ovary were normal, but there was a left hydrosalpinx with adhesions, necessitating removal of the left Fallopian tube. The patient made a good recovery. On visiting the Out-patient Department 6 months later she reported that menstruation was normal and free from pain.

INCIPIENT PERIMETRIC UTERINE ADENOMYOSIS, MILIARY IN FORM.

Jürgens refers to terms used by Albrecht and to Meyer's classification of benign uterine epithelial tumours. If localized inside the uterus or Fallopian tubes they consider the formation an internal uterine or tubal adenomyosis. If the proliferation develops forming tumours independent of the uterine mucosa it may be termed an adenosis or adenomyosis externa.

Jürgens describes such a case in its malignant form of interest as a contribution to the differential diagnosis of this affection from tuberculosis. His patient, aged 25 years, and unmarried, had suffered from no previous gynaecological trouble, till 2 months before admission to hospital, when abdominal pain with rises of temperature, rigors and slight cough began. She had lost weight, and her general condition suggested an incipient genital tuberculosis and appendicitis. Laparotomy was performed with a view to removing the appendix. The appendix was normal. The uterus was retroflexed and adherent at one extreme to the broad ligament. The adhesion was separated easily and it was there seen that scattered over the uterus, particularly at the fundus were numerous miliary nodules; a few nodules were also observed on the broad ligament. The rest of the abdomen was clean. A clinical diagnosis of tuberculous peritonitis with genital localization was made. A nodule was excised and histologically examined. There was no evidence of tuberculosis. The epithelial cells were precisely similar to those of the endometrial glands. The condition was one of incipient perimetric adenomyosis.

J. H. Filshill.

Revista de Gynecologia e d'Obstetricia Rio de Janeiro,

May 1937.

*A new method of pelvimetry. Filho.
Acute polyhydramnios. Rezende.
*A case of tubal pregnancy; rupture due to spinal anaesthesia. Avancini.
Semiology of uterine consistence during pregnancy parturition and puerperium. de Barros.
Chronic inversion of the uterus. Guimarães.

A NEW METHOD OF PELVIMETRY.

Adeodato refers to the value of pelvic measurements in estimating the ease or difficulty of foetal transit. He describes and illustrates an instrument he has devised for measuring the transverse and oblique diameters of

the upper pelvic strait. The instrument consists of forceps bent at its middle point of articulation in such a manner that when one limb is fixed the other opens. A graduated arc attached to the handle measures the distance the pelvic diameter allows the moving limb to extend. The instrument's maximal limit is 12 cms. Should the length of diameter exceed this length the strait may be considered absolutely permeable.

The method may not have as wide an application as some others, but Adeodato has employed it with success in nulliparae, and in the course of pelvic laparotomy.

ACUTE POLYHYDRAMNIOS.

De Rezende discusses views on the origin of amniotic fluid and on the causes of (*a*) chronic hydramnios relatively benign and more or less frequently observed, and (*b*) acute hydramnios "graver and usually leading to abortion" (De Lee). The latter is of rarer occurrence.

De Rezende classifies the causes of acute hydramnios in 10 groups. To the fifth group belong cases of monovular twin pregnancy. He describes a typical case which he has recently seen. The patient, aged 25 years, and pregnant for the fifth time, was admitted to hospital between the fifth and sixth months of pregnancy because of a sudden increase in the abdominal swelling and severe pressure symptoms—dyspnoea, nausea, vomiting, and paralytic ileus.

Following puncture of the membranes by the vagina, a discharge of 13 litres of amniotic fluid occurred and one semi-asphyxiated child was born. Palpation revealed the presence of another, which was born immediately after the artificial rupture of a second sac containing less than 100 c.c. of amniotic fluid. Examination of the adnexa showed that the pregnancy was monovular. Both children died the day after birth. Post-mortem examination showed that the internal organs of the first child were much hypertrophied compared with those of the second. Involution of the uterus was normal and the patient was discharged on the eighth day. Serum reactions from the maternal blood and from the cord were negative as regarded syphilis. The glycuria percentage was normal. Diabetes as the cause of the hydramnios was, therefore, excluded.

A CASE OF RUPTURED TUBAL PREGNANCY AFTER SPINAL ANAESTHESIA IN THE SITTING POSITION.

Avancini describes a case of ectopic gestation in which rupture occurred on the operating table immediately after spinal anaesthesia in a sitting position. The patient, aged 34 years, and pregnant for the tenth time, had been admitted to hospital 14 days previously and owing to her general condition operation had been deferred, though her history and symptoms left no doubt as to the diagnosis—an ectopic gestation after 5 months of amenorrhoea. After spinal anaesthesia and the change to Trendelenberg's position Avancini had his bistoury in his hand prepared for laparotomy when he noted a sudden change in the patient. The tumour had disappeared, and she was pale and pulseless. Without a second's delay he opened the abdomen, and found a ruptured sac with copious haemorrhage on the right side. The umbilical cord protruded from the sac; he extracted a foetus of 3 or 4 months.

Double salping-oöphorectomy was performed as there were inflammation and adhesions on the left side as well as the right ectopic pregnancy. The post-operative course was normal.

Avancini was certain that rupture had taken place during anaesthesia probably because the sitting posture necessitated a little strain. He points out the danger of anaesthesia in this position, and also the ease with which ectopic rupture can take place, even during a vaginal examination.

J. H. Filshill.

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REPORTS OF SOCIETIES

THE ROYAL ACADEMY OF MEDICINE IN IRELAND.

A meeting of the Section of Obstetrics was held in the Royal College of Physicians on Friday, October 15th, 1937. Dr. Bethel Solomons was in the chair.

Dr. J. S. QUIN gave his presidential address on

BACKWARD DISPLACEMENTS OF THE UTERUS.

He reviews the history of backward displacements of the uterus from the point of view of symptomatology and treatment, and gives an account of the present position of the subject, quoting from the writings of Continental, American, British and Irish gynaecologists. He regards the supracervical portion of the uterus as the only fixed portion—it being firmly held by the parametrial and paravaginal tissues. These tissues act as a pivot about which the uterus may rotate in the vertical axis. It must be regarded as a mobile organ with a normal range of movement of almost 120 degrees. The normal position of the uterus in anteversion and anteflexion is due to the forward tilt of the pelvis in the erect posture. The deviations from the normal standard are considered under three headings (1) congenital, unmarried; (2) congenital, married; (3) acquired, puerperal.

(1) This type rarely causes symptoms and still more rarely calls for treatment.

(2) On marriage a congenital displacement may make itself apparent in several ways, e.g. by causing dyspareunia; usually, however, the patient seeks advice for sterility or an early abortion. Should an early abortion be what brings the patient under notice replacement of the uterus and the insertion of a pessary for three months is advised. The uterus may then be found to lie normally or more commonly to fall back again. In this latter case the patient should be warned to report at once should she become pregnant for further pessary treatment. Operative treatment is recommended for patients with congenitally retroverted uteri who remain sterile after a reasonable lapse of time since marriage. Incarceration of the congenitally retroverted gravid uterus is rare.

(3) About 1 in 5 of the patients examined post-partum have this condition. He discusses the possible causes of the displacement and indicates the appropriate means to be adopted during the puerperium and third stage of labour with a view to avoiding it. The examination of all patients from 4 to 6 weeks post-partum is recommended, and that pessary treatment should be instituted should a retroversion be found. Even if the pessary does not cure the condition it will help in the proper involution of the uterus. Symptoms will only arise if the uterus is subinvoluted or if there is some descent of the uterus and vaginal vault. The modified Gilliam suspension operation is the most satisfactory, and its results have been very gratifying.

Discussion. Dr. T. M. HEALY said that when the President published his address he hoped he would not call pelvic disease pelvic pathology. There was no such thing as pelvic pathology. Referring to retroversion of the uterus, in women who had not any children, as a cause of pain, he said that every gynaecologist in these cases did two operations, he dilated the cervix and then suspended the uterus by the method which he preferred. It was very difficult to know which of these procedures gave relief from pain. He was not inclined to think that the cure of the backward displacement alone was sufficient to relieve the backache. In cases of retroversion which arose after the birth of a child, conditions were quite different, and in such cases he thought that the retroversion almost invariably caused symptoms. He quite agreed with the President regarding the frequency of abortion in women who suffered from retroversion. It was difficult to know whether it was the under development or the position of the uterus which brought about the abortion. Referring to the use of pessaries, he said that he had frequently put in a Smith-Hodge's pessary approximately 6 weeks after the birth of the baby in women who had retroversion, and he had been extremely disappointed with the results. In so many cases, when the patient returned a week after the pessary had been put in, the uterus was just as badly displaced as it was before the pessary was inserted. In women in whom puerperal retroversion persisted, symptoms always developed, and even nowadays a fair percentage of these women returned anxious to have further treatment. He had found that in cases of retroversion the use of a pessary had not led to conception, whereas an operation had almost always done so. The use of pessaries should always be avoided in women who could have an operation. He could not remember ever having seen a patient subsequent to operation who was dissatisfied with the result. He did not think it mattered very much which operation was done, provided the uterus was stitched so as to keep it forwards on the broad ligament.

The Master of the National Maternity Hospital, Dr. J. CUNNINGHAM, said that the President's paper had been very instructive and interesting. He thought the percentage of cases of retroversion in nulliparous unmarried women was very small, but cases of retroflexed uterus which was apparently congenital were often seen. In these cases he thought a pessary should be used. If the symptoms were sufficient to justify operation, it was always wise to dilate the cervix before doing a suspension operation. In cases of women married for three years or perhaps longer who were seen because of sterility he found that a very large number of them suffered from retroversion. In these cases he thought operation was justified, and he asked the patients to write to him in six months' time to tell him how they were, and it was gratifying to find that so many of them conceived. It was difficult to know in a good many cases whether the retroversion was really pathological or not. He thought it generally was, and that one was justified in operating. In cases of retroversion there was a much greater danger of the patients suffering from haemorrhage and other symptoms at the menopause. Patients who had retroversion were more liable to develop cystocele. He had not found the Alexander Adams operation very satisfactory. Formerly he had always used silk as a suture material, but now he used chromic catgut.

Dr. D. J. CANNON said that Professor Donald, of Manchester, had awakened the mind of the medical profession to the question of backward displacement. He had come to the conclusion that the symptoms in cases of backward displacement of the uterus were not due to the displacement *per se*, but to it in combination with other factors. Many cases of functional or uterine bleeding were due not to the backward displacement but to subinvolution of the uterus. If such bleedings were caused by backward displacement it was because the uterus was bigger than normal. Before operation one had to be very careful to make sure that the symptoms had regard to cause and effect. Dyspareunia in most cases had nothing whatever to do with backward displacement. In these cases cervicitis was invariably found and the pain was due to inflammatory bands in the parametrium. There was no evidence that dyspareunia was connected with congenital disease of the uterus. Women who suffered from congenital displacement frequently suffered from gastric symptoms, and in these cases there was always definite pyloric spasm, but sometimes no other symptoms. Correction of the uterine condition in these cases cured the gastric symptoms, with fixation of the uterus the pain disappeared. He always used catgut as the suture material. The operation should be done neatly and quietly, as if there was any haemorrhage there was a good deal of pain.

The Master of the Rotunda Hospital, Dr. A. H. DAVIDSON, said that puerperal backward displacement occurred in about one in five cases. Among these it was necessary to distinguish between the two types of retroversion. Some should be treated by pessaries, about 50 per cent to 60 per cent would recover without operation. If backward displacement was not cured by the use of a pessary operation should be done, otherwise the patients were very liable to have an abortion at a later date. The Alexander Adams operation was very satisfactory. Referring to cases of cystic ovary, he said that he thought it was very dangerous to take a piece out of an ovary. Most of these ovaries would recover after Gilliam's operation, and it was not wise to resect a cystic ovary. In many cases the backache complained of was due to posterior lymphangitis, and not to backward displacement. In cases of prolapse associated with backward displacement, Gilliam's operation was very seldom done now, Fothergill's operation was used instead. A good many of these cases were due to prolapse, and then much better result was obtained from a vaginal operation.

The Master of the Coombe Hospital, Dr. CORBET, said that in a parous patient with a mobile retroversion he always tried pessary treatment for three months, and he found that a considerable proportion of these patients became pregnant while wearing the pessary; then the question of operation did not arise.

In nulliparous patients, with dysmenorrhoea, he thought that, in addition to the dilatation, the backward displacement should be corrected by suspension of the uterus. With regard to the type of operation performed, he did, most commonly, the Gilliam suspension and the Alexander Adams operation. He would make a plea for the latter operation in parous women with mobile retroversion whose symptoms were relieved when the retroversion was replaced and a pessary inserted, and whose retroversion and symptoms recurred when the pessary was removed. He had had good results with the Alexander Adams operation in those circumstances and

it had the great advantage of leaving the abdominal wall intact and the peritoneal cavity unopened. Fixed retroversion, of course, must be treated by intra-abdominal operation.

If retroversion is found in early pregnancy he thought that it should always be replaced and held in position with a pessary. At the menopause a retroverted uterus was liable to cause symptoms and to be associated with a discharge. The symptoms were very often those associated with toxic absorption, and he thought that then the treatment should be total hysterectomy rather than any suspension operation. He congratulated the President on his excellent exposition of the subject.

Dr. O'Donel Browne congratulated Dr. Quin on the excellent way in which his presidential address had been compiled and delivered, but regretted that the subject proved to be too large for intimate discussion of the various points of interest which it aroused.

He was in complete agreement with the President in his observation that all puerperal retroversions which could not be cured after adequate Smith-Hodge pessary treatment should be cured at a later date by operation when there were symptoms directly referable to the retroversion. He also agreed that pessary treatment for retroversions or other abnormalities in the nulliparous patient were useless.

Relative to the question of operation *versus* pessary treatment, or no treatment whatsoever, for retroversions and retroflexions generally, Dr. Browne was of the belief that all such misplacements should be cured by operation, if they were causing any backache, menstrual disorders or other disturbances, as the patients suffering from these complaints usually had some psychological disturbance when they knew there was some abnormality present.

Dr. Browne then drew attention to the fallacy of the belief that the Gilliam, or modified Gilliam, suspension technique can cure ovarian congestion and varicocele. He pointed out that the engorged vessels would be noticed to be present at the moment of closing the abdomen if the suspension allowed the heavy ovaries to prolapse into the pelvis and kink them at the brim of the pelvis. In all such cases, in addition to performing some variety of Gilliam suspension, he suspended the ovary itself, by means of its mesovarium, to the peritoneum above the brim of the pelvis, thus allowing free venous return with relief of the dragging ovarian pain.

He also drew particular attention to a further point in connexion with the operative technique, showing clearly how the Fallopian tube on one or both sides could easily be drawn outwards together with the round ligament during the operation and thus kinking it and producing sterility. In such cases of underdevelopment of the round ligaments with close approximation of the ligament and tube, he performed a Baldy Webster or Kelly's suspension in preference to any modification of the Gilliam technique.

In conclusion, Dr. Browne drew attention to the fact that the various round ligament operations for cure of misplacement, although possibly quite satisfactory in practice, were not anatomically correct, as the position of the uterus primarily depended upon the state of the utero-sacral and transverse cervical ligaments.

He agreed with the Masters of the Rotunda Hospital and the Coombe

Hospital that a total hysterectomy would be preferable at the menopause to a Gilliam or other suspension operation when any uterine abnormality was present.

Dr. BETHEL SOLOMONS said that the paper constituted a plea for the operative treatment of backward displacement of the uterus. The question as to whether backward displacement was pathological was not agreed on. The pendulum as to its innocency had swung too far in many countries. Perhaps here it was regarded as too guilty. There were many indications for the treatment of retroflexion of the uterus. He, Dr. Solomons, had shown that a perfectly performed operation for displacement cured many cases of dysmenorrhoea. Sterility was often cured and this was natural, for in retroflexion the os uteri was so far from the receptaculum seminalis. Abortion was often caused by retroversion. When a woman complained of backache there must be a thorough clinical investigation, and only after radiographic examination of the spine and other tests must the backward displacement be blamed. It must also be remembered that gynaecologists get paid for operations and emolument for the gynaecologist must not be considered an indication for operation.

He agreed that all cases of apparent chronic appendicitis in women should be referred for examination to a gynaecologist to exclude pelvic disease. He believed that the subperitoneal Gilliam's operation was the best of all, but there were some indications for the Alexander Adams operation and that of Baldy Webster: the latter was indicated when there was any raw surface at the back of the uterus. The Alexander Adams operation brought about a perfect anatomical pull on the ligaments. Fine silk should be used as recurrence occurred after catgut.

He felt that the summing up of the subject was that when symptoms were present retroversion should be corrected by operation and not by pessary: if there were no symptoms the woman should be left alone.

Dr. A. W. SPAIN referred to cases of women who had had children and were seen with retroversion which was producing symptoms not immediately after the birth of the baby, but, perhaps, a year later. In these cases he sometimes replaced the uterus and put in a pessary; after this the symptoms were cured. He thought it was wise to be slow about operation in such cases, especially if the woman was still in the child-bearing age. He had seen many women who if treated with a pessary became pregnant very soon afterwards. In this particular type of case in which the woman might have more children he thought she should be given a chance with a pessary before any operative treatment. He did not consider that a pessary was such an evil thing as some teachers would have us imagine.

Dr. NINIAN FALKINER agreed with the speakers who had said that they did not operate in cases of congenital retroversion except for sterility. He wondered why a congenitally retroverted uterus nearly always became spontaneously anteverted during pregnancy. This fact suggested that the condition was not really a misplacement of the uterus but that it was its natural position. Why was it that a retroverted uterus in a nullipara could sometimes cause no symptoms at all, while in parous women it invariably did?

Dr. QUIN, in replying, said that he was glad to note that there was

a consensus of opinion about the utter futility of using a pessary in a nullipara. Pessary treatment for any cause whatever in the nullipara was utterly futile. Dr. Donald was very keen on the fact that all cases of retroversion with symptoms could be cured by dilatation and curettage. Most of them undoubtedly were cured, but the question was for how long did they remain cured? He thought that they were only cured for about six months. In the majority of these cases it was possible to cure the dysmenorrhoea by dilatation of the cervix, leaving the uterus still as a backward displacement. Referring to the late effects of a long-standing retroversion at the menopause, he said he had no doubt that in these long-standing cases trouble at the menopause was very likely to occur, a fact which he thought was another indication for early operation. Regarding cases in which there was pyloric spasm he said that he thought this was a definite proof that in these cases there was some reflex mechanism at work which caused the gastric trouble of which very little was known.

MEDICAL LIBRARY

The Seven Stages of JOHN BLAND-SUTTON and AN EPILOGUE

By

Sir COMYNS BERKELEY

Issued as a Supplement to "The Journal of Obstetrics and Gynaecology of the British Empire", April 1937.

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SIR JOHN BLAND-SUTTON BART.

Some surgeons cut you up like mutton,
But that is not the way with SUTTON;
Bland as his name, though stern of eye,
He couldn't bear to hurt a fly.

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UNIV. OF MICH.

The Seven Stages of

JOHN BLAND-SUTTON

". . . He was a man, take him for all in all,
I shall not look upon his like again."
Hamlet i., 2.

1855 to 1872

THE church clock having struck the hour of midnight, John Bland Sutton, as he was to be christened, first saw light in the early hours of April 21st, 1855, at Green Street, Enfield Highway, and soon was "mewling and puking in the nurse's arms". Thus he was wide awake in the early hours of the morning, foreshadowing a similar time when, with a view to imparting it to his pupils, he would sedulously be absorbing knowledge while sluggards slept.

The second son of a strong and healthy family, John ascribed his smallness of bone, shortness of stature, weakness of muscles, and that as an infant he was always ailing, to the fact that he was a premature child, being but 34 weeks old when his eyes opened for the first time. Contrary to that which obtained in his more mature years, as a child he was easily duped and had perforce "to learn wisdom in the stern school of experience".

John's mother was a daughter of Mr. Wadsworth, a Northamptonshire farmer, descended from an old yeoman stock of Warwickshire. A well educated and very industrious woman, among other things she taught her seven sons and two daughters to sew and knit. John particularly excelled in these accomplishments which, doubtless, had a distinct bearing on the striking rapidity of his suturing when he became a surgeon.

Over six feet in height, his father, Charles William Sutton, was a farmer, market gardener, and somewhat of a visionary. At one time in fairly comfortable circumstances, he would give away money, or lend it without chance of return, on but slight provocation; this thriftless trait leading to financial difficulties which were met, up to a point, by the Bland family.

Although Charles Sutton knew well his business, until his death from pneumonia at the age of 56 he was in his heart a naturalist,

and this hobby more or less obsessed him all his life. He was at the beck and call of every villager who chanced to encounter anything unnatural in the animal world. Thus from time to time he was the recipient of animals with two heads, accessory limbs, overgrown incisor teeth and other malformations. Living in such an atmosphere, John, with a reversion to type, became intensely interested in such sports of Nature, an interest which far outweighed all others to his closing years. His father was very fond of stuffing birds and animals, and smoothing their feathers and fur with his hands and fingers, which were strikingly adequate for the purpose, the specimens were mounted in very natural poses: in fact, a self-taught first-class taxidermist. It is not to be wondered at, therefore, that John imbibed the fascination of a museum, a fascination which was to bear such wonderful fruit in the future. He would sit for hours watching his father thus occupied, and, dissecting the specimens deprived of their outer covering, he commenced his introduction to anatomy, of which he was to prove such a great master; this environment influencing the whole of his subsequent career.

Owing to his want of stamina, and to an accident which befel him, he could not join in, neither did he take any interest in, the common amusements of childhood. He was fond of hanging on to a side of the farm wagon, placing one foot on the box of the wheel, and one day when thus occupied he slipped and injured his foot, entailing a disability by which he was handicapped for the rest of his life.

John thus appears to have spent all the time he could wandering about the countryside, learning the names and studying the surroundings of butterflies, flowers and plants, and watching the peculiarities and activities of wild animals, as they grew and flourished under the canopy of heaven.

During his schooldays he formed a great friendship with a retired doctor, Patershal Jones, who lived in the same street. He would spend hour after hour with the doctor acquiring information, snapping up "unconsidered trifles", and with a bewildering curiosity, a curiosity which to him was a perpetual wooing of wisdom, asking innumerable questions and accumulating scraps of science which he implemented by reading every book on natural history and travel he could lay his hands on. He thus became infected with the germ of *Wanderlust* which was never exterminated, as witness his travels to Brazil, up the Amazon to Manáos, Canada, across the Rockies, East Africa, Uganda, across the Victoria Nyanza Lake to Jinga to see the source of the Nile,

Egypt to Gondokoro via the White Nile, the United States of America, Mexico, South Africa, Rhodesia and the Victoria Falls, Russia and most of the other European countries, Spitzbergen, the West Indies, and round the world. "He delighted to wander in unknown places, the labour being lessened by his zeal for information."

Among the books which John first acquired were the "Technical Educator" and Cassell's "Popular Educator", and one wonders how he procured them, since he never appears to have had any money to spare, and the price on the fly-leaf of the latter was pencilled as 50*s*. The section on "Penmanship" had been well thumbed, to some purpose, since, till his eightieth birthday, his calligraphy was most distinct and as neat as ever; he wrote a beautiful hand. It is interesting that in the course of time (1893) Cassell's published his greatest work, "Tumours, Innocent and Malignant", which were classified on an embryological basis and illustrated by comparative anatomy.

In his early days the two books which most fascinated him were the Bible and Shakespeare. His introduction to Shakespeare was due to his having to learn by heart many of the striking speeches of the *dramatis personae* of that poet. The interest thus started never flagged, and although he had often stood outside a theatre, reading the names of the actors and actresses on the play-bills and watching the audience going in, he had never seen a play till he was 29 years of age. Later it was his boast that he had seen every play of Shakespeare acted.

His acquaintance with the Bible was due to his discovery, when young, of some unbound and illustrated numbers of the Old Testament. These he read over and over again, not counting it as a punishment to be locked in his room for some youthful escapade, but rather as a most welcome opportunity to read about the days and deeds of Samuel, David, Judah and Israel. One can imagine how fascinated he must have been on reading Genesis, that living picture-gallery of men and women, with its account of the creation of the world, of the origin of species, and of the Ark with its complement of living cargo. The wood-cut illustrations especially interested him, and one realizes why he had his own books so beautifully illustrated with wood engravings, refusing to employ photographs or wash-drawings as unsuitable adequately to demonstrate the points he wished to display.

John thus acquired a great and peculiar knowledge of the Bible and Shakespeare; peculiar in that in his addresses, speeches and writings he was fond of introducing very apposite quotations

from this book or this author. It was his wont, for many years after he qualified, to read portions of the Bible or Shakespeare before going to bed, to which habit he accounted his literary style, facility in writing, and knowledge of English.

John was sent to the church school of St. James the Great at Enfield Highway, and far from "creeping like snail unwillingly to school", he welcomed an attendance thereat, and, having an immense capacity for work, soon proved to be the cleverest boy. At the age of 15 he was being trained to become a pupil teacher, which education was finished in London, under a contract that, when he had passed the qualifying examination, he should return to his native village and take the boys' class at the village school and be superintendent of the Sunday school, which he did and was.

1872 to 1878

From the time he became a schoolmaster until he entered the Middlesex Hospital John's life is not well documented. Mr. Bland, his maternal grandfather, was a wealthy Irish cattle dealer, and had sent his son, accompanied by his two sisters, to manage a depot at Islington. It is known that John spent his holidays with his uncle and aunts at Islington, not infrequently walking all the way from Enfield to save money, or to purchase some book he hankered after, and it was during one of these holidays that an assistant stuck a knife into the middle finger of John's right hand, laying open the joint, and the wound became septic. It was decided to amputate the finger, and the owner thereof took great interest in the instruments assembled for the purpose. At the last minute, however, this decision was abandoned, the result being that recovery took place with a permanently flexed finger, which Dr. Day, the family practitioner, remarked "Is better than no finger, since he can hold a scalpel, although he will never make a doctor, as he is not clever or strong enough". John was determined that this misfortune should not interfere with his manual dexterity, and that which would have been a serious handicap to most surgeons did not appear to have the least influence on his unrivalled powers of operating. To enliven his convalescence, Dr. Day lent him a dried dissection of the forearm, and the time was spent in memorizing the names of the bones, muscles, blood-vessels, and nerves.

In due course John became dissatisfied with his position of a schoolmaster. For some years he had been endeavouring to grasp

the principles of physical science, stimulated by Herschell's "Study of Natural Philosophy", and he began to consider to which branch of science he would be most fitted. As a boy he had chanced across a book on elementary astronomy, and used to amuse himself of an evening picking out the planets and stars. His thoughts, therefore, turned to this science, but reading more deeply into the subject he realized that an extensive knowledge of mathematics was essential and, although he could, and would, take infinite pains over any subject in which he was interested, he had no taste for mathematics and could never take any pains with his sums. Thus he reluctantly abandoned this idea, although his interest in astronomy remained to the close of his life. He would get out of bed at any hour of the night or early morning to search the heavens, and one of the most delightful presents he ever received—so he said—was the astronomical telescope given to him by his former house surgeons and pupils when he retired from the office of senior surgeon at the Middlesex.

During the latter part of this stage John was helping his uncle at Islington. His mother's people were very religious, and indeed rather intemperate in their religion, Sundays, apart from church-going, being kept strictly as days of rest, even more so, if that were possible, than in Scotland. John's rest was, however, somewhat disturbed whenever he happened to be staying at Islington on a Sunday, by his having to read to one of his aunts, who was paralysed, the Collect and Lesson of the day, and, if these were short, the Psalms in addition. This diversion, though enlarging his acquaintance with the Bible, certainly tended to increase a doubt which was threatening to blossom, at which his aunts would have been horrified, in that he began to suspect their belief that the Bible contained the truth, the whole truth, and nothing but the truth was, perhaps, not so well founded as they fondly imagined. When exactly he cemented his unorthodox views is not apparent, but the turning point seems to have arrived when he became deeply involved in the writings of Darwin, Huxley, Owen, and Tindall, and he was so deeply impressed by an address of the latter at a meeting of the British Association in 1874, dealing with the conflict between religion and science that, as he used to affirm, his conversion was then completed.

It was during 1877 that John, after the accident to his finger, realizing that science must be the foundation of anyone wishing to excel in medical or surgical practice, decided, if possible, that he would enter the medical profession, as being one in which his considerable knowledge of, and interest in, natural history could

be put to the best account. He had saved every penny he could, being mindful of the proverb, "a pin a day will fetch a groat a year", and so he approached his uncle on the subject who replied, "I think this can be managed," with the result that the uncle and aunts supplied him with sufficient money, but not more than sufficient, to keep him during the years he was a medical student.

In most things Bland-Sutton did he differed from others, and his entrance into the medical profession was a characteristic illustration. The die having been cast, John at once began to inquire how he could become qualified in the shortest possible time and at the least possible expense, having discovered that the dissecting rooms at the hospitals were not open in the summer and that, moreover, students had to pay for the 'parts' they dissected. While turning these things over in his mind he read an advertisement in a newspaper concerning a school of anatomy in the Blackfriars Road, owned by a Mr. Thomas Cooke, one of the surgeons at the Westminster Hospital. This surgeon had conceived the idea, and had carried it into effect, of establishing such a school for those students who were either lazy or not particularly clever and so had failed to pass the first conjoint examination. Even in those days dead bodies for dissection were hard to come by, but Cooke appeared to have sources, and resources, which were unknown to other teachers of anatomy, since his school was always well supplied. Owing to an unfortunate episode, Cooke had to transfer his school to a house in Brunswick Square, at the back of which there was a disused burial ground, and partly over which he erected a dissecting room, and it was here that John was established. It happened in this way. The owner of the house next door, in the Blackfriars Road, was one evening giving a little party, and when conviviality was 'well away' there was a violent peal of the front door bell, and the maidservant returned with the information, loudly declaimed, "Please, sir, the corpse has arrived"; and it was this *contretemps* which necessitated a transference of the school to other quarters.

John at once set off in a hurry to interview Cooke, and having persuaded him that he was a first-rate dissector and had read some elementary books on anatomy, a bargain was struck: John was to dissect the 'parts' for demonstration, and in return his salary would be a free attendance at the anatomy lectures. He was thus able to dissect the whole body twice before he joined a hospital, and in due course gained such a knowledge of anatomy that Cooke offered him a salary if he would stay and help to teach

the 'chronics'. Although the money was very tempting, such an appointment, so it seemed to John, led only to a dead end, and he began to consider which hospital he should join. Chancing to read the report of a trial in which the Judge expressed the opinion that if it had not been for the great ability of the house surgeon from "The Middlesex", the victim would certainly have died and the prisoner just as certainly been hanged, John remarked, " If Middlesex can turn out such a splendid man as this, I'm going to Middlesex".

1878 to 1882

Accordingly, on April 25th, 1878, John went to the Middlesex Hospital and asked to see the Dean, Mr. Andrew Clark. To him he stated that he wished to become a perpetual student, understood that the fee was £100, and, then and there, counted 100 sovereigns out of a bag, placing them one by one on the desk before the astonished eyes of the Dean, a sum of money which had been accumulated by many deprivations. The Dean, being left with the 100 sovereigns, sent for Dr. Cayley (the late Dean), and asked whatever he was to do with so much cash. This wise physician advised the Dean at once to take the money to the bank, which he hastened to do; but history relates that he had a small hole in his pocket and on his arrival at the bank discovered, as he handed the coins over the counter, that the 100 sovereigns with which he had started had been sadly depleted. Thus the name of John Bland Sutton appears as a perpetual student on the roll of the hospital, in his own neat handwriting, nobody at that time ever dreaming that the new student would become the most eminent of its *alumni* and, perhaps, the most eminent surgeon of his time. Head and shoulders above his contemporaries, he retained this position during his 42 years' service at the hospital.

The summer session was thus occupied in passing the Arts examination, including botany, chemistry, and zoology, the prize for botany being secured, while the vacation witnessed a return to Cooke's for two months. The winter session having started, the first difficulty which presented itself was that the 'parts' for dissection had to be paid for, and in advance, money which he could ill afford to spare. It then dawned upon him that if only he could help the other students with their dissections he could obtain additional experience without any additional expense; and so he called on Mr. Morris, the lecturer on anatomy, and announced that he wished to be a prosector, backing up this application with a letter from Cooke to Morris stating that it

would be well worth while appointing Sutton to such a post. Morris, however, was not the sort of man to be at all impressed by such an application or such a letter, in fact neither had any interest for him. He did say, nevertheless, that the department of anatomy was in need of a prosector, that he was going to hold an examination for this post, and that if Sutton really thought it worth his while (Morris probably had his tongue in his cheek, a habit he had on occasions) he would allow him to enter for it, although there were some remarkably good candidates. Since Sutton was already familiar with Gray's "Anatomy" from cover to cover and was then studying Sappey's great treatise, he certainly thought it would be worth his while, and, jumping at the opportunity, far outshone all his competitors, was appointed prosector for the session, and in 1880 junior demonstrator of anatomy. Thus began a service in the anatomical department, ending as lecturer and stretching over a period of 17 years during which he proved himself a brilliant anatomist with a wonderful flair for conveying information to students in a somewhat peculiar manner—peculiar, since he had a way of throwing off some fact or observation with such flippancy that it stuck in the memory, and the students thus learnt more than from their strictly formal teachers; such demonstrations being known as "Sutton's entertainments".

He had a hard time as a student, with "no over-full belly" to hinder his zeal for the acquisition of knowledge. To save money he walked everywhere he could, and he but seldom bought newspapers, maintaining that the contents-bills contained all the news he required. He had but little money for clothes, and while his fellow-students left the hospital for a good lunch at a neighbouring hostelry, he ate his frugal meal of a few dry biscuits and drank cold water in the prosector's room. Working all day, and then late at night in his lodgings in Canonbury Square, he acted up to his contention, "Well, I find that I can do with five hours' sleep, the rest of the time I work".

Owing to this great concentration on his work and, perhaps, a little to his physique being below the average, Sutton did not join in the sports and side-shows of the other students, so that he was less intimately known to them than he might have been. He conquered their goodwill, however, by his desire and ability to help them in any way he could, and what little popularity he had was tinged with more than the usual amount of respect. His only friends were his books, unless there be counted the anatomical and pathological porters with whom he spent a good deal of

time in the preparation rooms, and other subordinates of the hospital, picking up every scrap of knowledge he could. All this developed his wonderful personality, for he always took the part of a master and never that of a pupil. Perhaps the most striking thing about this personality was that Sutton was never one of a crowd; he was either the principal or vanished. He was "not born to serve, but to command". With a curious intuition that he was going to do something big, big he was in all his surroundings; and a somewhat Mephistophelian manner encouraged but little attraction for others, except for the wealth of knowledge which was forthcoming. He was always up to his eyes in anatomical specimens and so came to be known to the students as the 'moulting bird'.

Early in Sutton's career, Sir William Flower, the President of the Zoological Gardens in Regent's Park, took an interest in him and "allowed him the run of the prosectorium and any material he wished to dissect". He was thus able to study comparative anatomy and gain experience of the pathological conditions to be found in the animals in the charge of the Society. For nine years he was, more or less, a regular visitor to the prosectorium, and in addition he performed the post-mortem examinations on many of the animals that died.

> When other men were in the fields
> At pastimes not a few,
> John could be found dissecting seals
> And monkeys at the Zoo.

So wrote a witty student, and from the Zoo many strange creatures found their way into the prosector's room at Middlesex, including on one occasion a great brown bear, dead, in a four-wheeled cab. On another occasion, walking along Mortimer Street, with a couple of dogs nosing at the dilapidated bag he was carrying, Sutton entered the Middlesex and dived into the prosector's room, discharging on to the table some titbit from the Zoo. After gloating over it for a short time he exclaimed, "Here's a treat", and eagerly proceeded to dissect it, soliloquizing jerkily the while, "Dogs are nice creatures, but too inquisitive, several on my way from the Zoo were too attentive. I don't know whether it was the bag or my calves they were interested in. Possibly they thought they scented in the bag the remains of a long lost brother; but they were wrong, it was part of a peccary, and pathological at that". He never dissected a whole animal, but always went for some feature in which he was interested, discarding the rest of the

carcass. Next to his greatest work on tumours, he always thought his best book was that on ligaments, which he prepared for publication when a demonstrator, and which his fellow demonstrator, Essex Wynter, beautifully illustrated. These two books and the Jacksonian Prize Essay, on diseases of the ovaries and uterine appendages, were mostly the results of his work at the Zoo, to which he always remained very attached, and of which, in 1926, he was made Vice-President.

It was a great treat to accompany Sutton to the Zoo. His intimate knowledge of its inhabitants, their peculiarities, and their tricks was a source of interest from start to finish, and the following were his favourite yarns. A lion had a dew-claw growing into its foot, causing great pain and lameness. The lion having been lassoed and tethered to the bars in front of its cage, its foot was roped and pulled through the bars, when Sutton removed the source of the trouble with a pair of carpenter's pliers, much to the indignation of the lion. A year or two later the lion became similarly afflicted, and when Sutton went to its cage to make the preliminary arrangements it put its foot through the bars and allowed the dew-claw to be removed without fuss or fixation. A hippopotamus had a large abscess in its jaw, and when it had been firmly fixed to the railings of its yard, Sutton plunged a gardener's sickle into the abscess, whereupon the beast charged forward, bringing down the railings and the wall to which they were attached, scattering Sutton and his attendants, and then let its keeper conduct it quietly back to its house. The secretary of the Zoo one day received three dozen pairs of red flannel knickers from an old lady, with the intimation that it was his duty to see that the monkeys were properly dressed.

Sutton was always a Doubting Thomas, and never took anything for granted, unless he could feel and handle it; he would never be taught, but was always keen on learning. Thus his attendance at lectures was very erratic, although, by a private understanding with the porter who marked the attendances, he managed to satisfy the Dean. A decade or so later, when Hunterian Professor, some of his lectures being short of the official hour, the President of the College warned him that unless he gave full value for his money a reduction in his stipend would have to be made. He was, thenceforth, able to satisfy the President that 60 minutes had passed, having, by a similar understanding, engaged the porter to advance the hand of the clock 15 minutes when the attention of the audience was fixed on the lecturer. It was not that he wished to shirk his work, but all

his professional life he contended that no one could keep his attention fixed at a lecture for more than 45 minutes. When a student he is said on occasions to have fallen asleep at lecture from sheer fatigue. Once he not only fell asleep, but began to snore loudly. Morris, having requested the student next to Sutton to wake him up, addressed the culprit as follows: "Now, sir, wake up and attend to my lecture and then you may, perhaps, acquire some knowledge of anatomy. Give me the relations of the Gasserian ganglion" (one of the subjects already mentioned in the lecture). Though slightly bewildered, this Sutton did without a moment's hesitation, in perfect textbook fashion, which caused a titter to pass round the class, somewhat to the confusion of the lecturer.

On the other hand, he appears to have been very diligent in attending the physicians and surgeons in the out-patient and in-patient departments. In those days when a student joined the Middlesex he was expected to follow the clinical work in the hospital as well as working for the first conjoint examination in the medical school. A reference to the hospital register shows that the students who entered with Sutton in 1878 were appointed clerks and dressers at once. Perhaps a relic of the old custom of "walking the hospital". Thus in the register Sutton is entered as clerk to Dr. Cayley and Dr. King, and dresser to Mr. Morris and Mr. Clark, the reports of these officers on his work being "very satisfactory", "very satisfactory", "very regular in his attendance and very attentive", "very satisfactory and attentive".

During his student days Sutton won the chief scholarships and prizes, but he valued such achievements only for the books or money they provided, so that when he won the Murray Gold Medal for surgery he was most delighted, and visited a pawnbroker to exchange it for cash. This tradesman, however, was entirely conversant with the peculiarities of most of the medals awarded by medical schools, and proceeded to break this one in half, when, to Sutton's astonishment, not to mention his keen disappointment, it was found to be stuffed with lead.

In 1880 Sutton spent his summer holiday in Paris, attending the medical and surgical practice at the Hôtel Dieu, and that of 1881 in Vienna learning the use of the ophthalmoscope, as he had decided to take up this branch of surgery, after seeing Mr. George Critchett, who was the leading ophthalmic surgeon in England, at work in his clinic at the Middlesex. However, having received a letter offering him the post of senior demonstrator at Middlesex, he decided to become a general surgeon.

1882 to 1896

He qualified in August 1882, but could not afford to take a post as house surgeon, since there was not any pay attached to it; on the contrary, the house physicians and surgeons had to pay each of their chiefs £10 10s. for the honour of being thus associated with them, and Sutton probably had but little more than 10 pence to spare. He regretted this lack of experience all his life. Never having been a resident may also account for his trivial interest in medicine as such, regarding, as he did, most drugs with disfavour and a few, secretly, with alarm. He was ploughed the first time he entered for the medicine part of the final examination, nevertheless, two years later he was awarded the Murchison Scholarship of the Royal College of Physicians, a high medical distinction, in the same week that he passed the final examination of the Royal College of Surgeons. On one occasion, when he was seriously ill with a septic finger, and attended by one of his colleagues, he managed to persuade his nurse that he had never been able to take medicine if anyone was looking on. When he recovered his wife found the carpet under his bed entirely ruined by the doses of medicine which he had poured on to the carpet instead of into his stomach.

Having removed to Gordon Street, he had not sufficient money to pay running expenses without taking resident pupils to augment the income he was able to earn by coaching. He had, before qualifying, coached students privately for their examinations, and his first batch of pupils, though doubtless profiting largely by his teaching, were not in any particular need of this extra help, but were well off, for students, and decided to engage him as a coach, so as to supply him with a little extra money. For the first few years in Gordon Street, Sutton was mostly engaged in coaching men in anatomy, especially for the Primary Fellowship, and had, probably, the unique experience of passing this examination in company with some of the students he had taught. After a hard day's work at the hospital he would be occupied with teaching till late hours, in a room set aside for the purpose in the basement of the house, and at times was so tired that he would almost fall asleep while drawing diagrams on the blackboard, forgetting, momentarily, the point he was demonstrating. He was a bad draughtsman to start with, but gained several tips from watching the pavement artists. He used to take inordinate pains in the preparation for his demonstrations, and more than once had been

surprised drawing in coloured chalks on a blackboard and addressing the furniture in an otherwise empty bed-sitting room; a rehearsal of his demonstration for the morrow.

In 1884 Sutton was appointed assistant curator of the hospital museum, in which he took the greatest interest to the close of his life. In 1886 he was appointed lecturer on comparative anatomy, and in 1892 lecturer on biology. Having learnt some Greek, since he found that with a knowledge thereof it was easier to teach the students because of the scientific nomenclature, he turned his attention to German. For many months a patient of that nationality, upon whom he had operated in the hospital, used to go round early every evening to Gordon Street to give him a 30 minutes' lesson; he continued this study when on an excursion to Heidelberg, where he worked all day with a German tutor, refusing to go on any expedition, or visit any of the sights with his holiday companion.

Having obtained the Fellowship of the College of Surgeons in 1884, Sutton received some tempting offers, among them one from Sir William Flower to join the staff of the College with the idea of eventually being appointed the Curator of the Hunterian Museum, another to a chief post in the laboratory of the Marine Biological Association at Plymouth, and yet another to be a Professor of Anatomy, but turned down all such offers, and was appointed Assistant Surgeon to the Middlesex Hospital in 1886. He was thus the first student trained at this hospital to be elected to its honorary medical staff, the nearest approach to this being Sir Henry Morris and Mr. Andrew Clark, who joined the hospital as Registrars from Guy's Hospital and University College Hospital respectively. It was not surprising, therefore, that the majority of the members of the staff, coming from other hospitals, were biased when appointments at the Middlesex Hospital became vacant, and although there were, as candidates, Middlesex men entirely fitted for such posts, candidates from other hospitals were elected, which was a curious reflection on the teaching proficiency of those members of the staff, since they preferred to have as colleagues young men whom they had not taught in preference to those they had. There was, however, a small minority on the staff which believed, and rightly so, that if this pernicious habit was persisted in much longer the medical school would be ruined; and, indeed, it nearly was, the number of entrants declining to an alarming degree, and the non-Middlesex members of the staff began to get very nervous. To save the situation Morris started a school fund, with a gift of

£1,000, and by this generosity, together with the great loyalty to the Middlesex of Dr. Cayley, Sir Henry Morris, Dr. Essex Wynter, and Sutton, the school became rehabilitated, and now holds a position second to none in London.

To some of his old pupils who had settled down in practice in poor neighbourhoods Sutton was very generous, operating on their patients for such fees as he was told they could afford, which were often extremely small, and at times operating without a fee. As their practices increased in value these men sent him all their surgical cases, and this connexion eventually became very valuable and one which he always mentioned with gratitude. His first Caesarean section, and without a fee, was on a patient of one of these doctors, who tracked him down at a meeting of the Pathological Society, and Sutton, being asked whether he would like the case, replied, "Rather, but let me answer this chap first". The patient was thus delivered on the table in a small dirty and untidy kitchen in Summers Town by the Porro operation, then the usual method of performing hysterectomy. The patient recovered, and Sutton declared that never again would he employ this particular method, and he never did. He had to attend the patient for some days before the stump sloughed off, and for many weeks before the resulting large cavity granulated up. It was at Gordon Street that he founded a club for "general conversation", his object being to improve his powers of speaking. This club met weekly for some years, and ceased to exist when four of its members married and two died by their own hand. He was very fond of cards and a glass of beer, but gave up both as he was fearful that he would become addicted to them.

So long as he remained at Gordon Street, Sutton continued to receive, from time to time, all sorts and bits of animals, which were deposited in a small garden at the back of the house. In time the increasing resentment of the resident pupils to the malodorous fumes which at times permeated their surroundings, culminated in a crisis when two large sharks were so deposited in very hot weather, and required a prolonged investigation. The pupils were not allowed a latch-key, since Sutton was generally working so late at night, or so early in the morning, that he was always available for opening the door. Occasionally, either a student would arrive very late, or Sutton would have retired to rest earlier than usual. After many tugs at the bell two heads might be seen hanging out of the windows above, the one from the top floor that of the maid, the other from the third floor that of

the master, when there would ensue a heated argument as to who should go down and open the door.

In 1886 Sutton married Agnes, daughter of Mr. Hobbs, of Didcot, having first met her at the house of the village doctor who had called him down to operate on one of his patients. Their very short honeymoon was occupied with re-arranging the drawing-room at Gordon Street as a museum.

When his time came to be appointed lecturer on surgery, Sutton refused to give any set lectures, as he did not believe in them, and so got into trouble with the Board. In the end a compromise was reached by his being allowed to give lectures, but regularly, on any surgical subject he thought fit, which was more often than not his pet subject at the time, and on which he was probably writing a paper or a chapter of a book. On the other hand, he would take exceptional trouble with lectures on subjects which interested him, and his 18 lectures at the College of Surgeons between 1886 and 1891 on Evolution and Disease were outstanding contributions and aroused world-wide interest.

In his experience at the Zoo he had investigated many examples in animals of tumours of the teeth, dentigerous cysts, and other abnormalities, and later, when he was practising as a surgeon, he continued this interest in his human patients. He thus came into contact with dental surgeons, and contributed many papers on these subjects to the various dental journals. From his first paper in 1882 to his last in 1906 he was thus responsible for 29 papers and demonstrations, which he illuminated not only with his knowledge of comparative anatomy and evolution, but in addition with 98 beautiful illustrations. He was always regarded as the surgeon to dental surgeons, for whenever they required a surgical opinion, to him they almost invariably turned. Being particularly interested in odontomes which he collected from human patients, domestic and wild animals, his classification was universally accepted, and forms the basis of the classification to the present day. In the dental world he was as well known as in that of surgery, and no other surgeon has possessed the same relation.

Sutton was, in more ways than one, a great friend to the veterinary profession. At one time he was lecturer in pathology at the Royal College of Veterinary Surgeons, where he was very popular and always accessible to the students, who used to form a circle round him at the close of the lecture and ply him with puzzling questions which amused him to answer.

In 1889 Sutton removed to Queen Anne Street and gave up

taking resident pupils, but during the next six or seven years encountered a great deal of professional worry. Having made an intensive study of the pathology and anatomy of the pelvic organs of female animals, he became interested clinically in similar organs of the human female. This aroused the hostility of many of his colleagues, and so marked was their objection to such abdominal operations that the medical committee and the Board of the hospital directed that if he persisted in performing such operations they must be carried out at the top of the hospital, that there must always be a consultation beforehand with other members of the staff, that strangers must not be admitted, and that every specimen removed had to be the subject of a special report, such report to be submitted to the medical committee and the Board. Moreover, Sutton realized from his knowledge of the anatomical relations and pathology of fibroid tumours of the uterus that they could easily be removed by hysterectomy and the patients restored to health. Unfortunately, he suffered the same fate as did Sir Spencer Wells in the case of ovariotomy, being "almost done to death by slanderous tongues". He incurred not only the hostility of his colleagues in thus pursuing a course of treatment which he had determined to establish, but also, if possible, greater hostility from the leading members of the profession, especially from the obstetricians and gynaecologists, who contended "that it almost amounted to murder to attempt such removals". The leading obstetrician of the day, with all the majesty of his position, declaimed from his throne that the treatment these women required was "fresh air, lots of rest, good butter, and new laid eggs", and the medical heavens re-echoed with the applause of his satellites. How many women thrived on this simple prescription, albeit a somewhat expensive one, will never be known, but vast numbers were, or had been, relegated to a life of invalidism, till time or death relieved their sufferings. In spite of such handicaps, Sutton pursued the even tenor of his way and, his results and writings commanding recognition, in the end all opposition not only quietened but, like the smile on the face of the Cheshire cat, gradually faded away. This was Sutton's outstanding contribution to gynaecology, and every gynaecological surgeon from that day to this is indebted to him for such pioneer work. His anatomical knowledge and technical skill enabled him to deal successfully with those tumours which had, up till then, been deemed impossible of removal. As Victor Bonney wrote in his appreciation in the *British Medical Journal*, "He raised the status of abdomino-pelvic surgery out of the

narrow rut of specialism in which it threatened to stick, and created the gynaecological surgeon in place of the gynaecologist''. Just as Spencer Wells made a fortune out of ovariotomy, so Bland-Sutton made a fortune out of hysterectomy.

In those days beds were not allotted to the assistant surgeons, who had thus to rely on the generosity of their seniors, which, so far as lending beds was concerned, was not at all striking. The fact that beds were not so officially allotted may not appear to be of any importance to laymen, but it is well recognized in the medical profession that the only way a young consultant can build up a legitimate practice is to have the opportunity of admitting into the hospital to which he is attached hospital patients of those doctors who employ him for their paying patients. This want of beds was a continual bar to Sutton's progress, so much so that he took to operating on certain cases in the out-patient department, the patients, after their return home in a cab, being treated by their own doctors. No harm was ever known to have resulted from this practice, but it was abolished at the instigation of his colleagues, and Mr. George Lawson, one of the senior surgeons and a very kind man, gave Sutton a few beds.

An unfortunate incident towards the end of this stage turned out, fortunately, to be a blessing in disguise. This incident, though purely domestic in nature, must be mentioned because of the profound effect it had on Sutton's future career. At this time Sir Henry Morris had a world-wide reputation as the chief exponent of renal surgery, and was the first surgeon to remove a stone from the kidney of a living patient. Once a year, during the summer holidays, the assistant surgeons had full charge of the beds of their respective seniors, and, therefore, Sutton had charge of Morris's beds. His tact, however, was not commensurate with his enthusiasm, since when Morris returned he generally found his beds fully occupied by patients upon whom Sutton had quite recently operated, which meant two to three weeks before the senior would again have full charge of his beds. A more loyal friend than Morris, in my opinion, never lived, but he was a very dignified man and most jealous of his prerogatives. The climax came when Sutton, fired by the great success of Morris in renal surgery, proceeded to follow his master in this branch of surgery, and on one occasion when Morris returned from his holiday he found that a large number of the beds in his ward were occupied by patients recovering from renal operations. He was thus obsessed with the idea that the admission of these patients from the out-patient department into the hospital had been delayed

pending his holiday. Sutton, on the other hand, maintained that the patients had been sent to him by those doctors who employed him for their private patients. Up till then Morris had been Sutton's greatest supporter at the hospital and had befriended him in many ways since he had entered as a student. This incident, however, was more than a man of Morris's temperament was inclined to swallow; their relations became strained and were never again the same, to their mutual disadvantage and also to that of the hospital. I had private interviews with Morris and Sutton in an endeavour to close the breach, but to no purpose, for although Sutton was anxious to 'make it up', I could never persuade Morris to let bygones be bygones, his nature being such that he was unwilling to tolerate any prospective opponent in his particular line of surgery, and what was done could not be undone. The senior and junior thus parted, and things began to look very black for the junior when the Medical Officer of Health for Fulham suddenly closed the Chelsea Hospital for Women.

1896 to 1911

This hospital had been closed towards the end of 1895, due to a scandal caused by the bad results of those general practitioners who formed the staff of the hospital. However, out of evil cometh good, and following the public outcry a committee was appointed, the members of which were selected by the Presidents of the Royal Colleges of Physicians and Surgeons (which included Sir Henry Morris), with the late Lord Balfour of Burleigh as chairman. The purpose of this committee was to select a new staff for the hospital, and among the vacant posts was one for a surgeon, to which Sutton was appointed, owing his election entirely to the support of Morris.

In 1898 occurred the untimely death of Sutton's first wife at the age of 39, who was thus robbed of the delight of enjoying with him the fruits of his labour, which were to be gathered in the future in such abundance, but, on the contrary, had to share with him the worries and trials of the closing years of their married life. Like the wives of those young consultants who use every endeavour to increase their professional status by spending their evenings, after the day's work, in contributing papers to and debating at the meetings of medical societies, writing papers for medical journals, or occupied with the authorship of some book, she had not enjoyed that close companionship with her husband

which obtains with those of most other professions. She was a very kind woman and a favourite with the resident pupils.

In 1899 Sutton changed his surname by deed poll to Bland-Sutton, and on his birthday in this year he married as his second wife Edith, youngest daughter of Mr. Heather Bigg. In 1901 he removed to Brook Street. This beautiful house was for the next 28 years the scene of unstinted hospitality, both personal, and collective, in the form of banquets on many occasions to medical societies and associations. On the social side he was assisted enthusiastically, and very notably, by his clever and most capable wife, for whom he had the deepest affection; a *châtelaine* entirely worthy of such a man.

Bland-Sutton now had charge of 15 beds, and devoting his practice to abdomino-pelvic surgery, among other things perfected a method of performing hysterectomy and greatly improved the technique of other pelvic operations. He appeared to lose interest in general surgery, the surgical treatment of diseases of women appealing to him mostly, and although later as full surgeon to the Middlesex Hospital he brought his skill to bear on all patients admitted to his wards, in private the bulk of his practice was concerned with abdomino-pelvic surgery, and he came to be recognized as the leading gynaecological surgeon of his day. During the 15 years Bland-Sutton was at Chelsea his fame spread far and wide, and on his operating days his theatre was generally crowded with medical visitors, among whom, from time to time, would be numbered the leading surgeons from other countries. He lived to have the rare satisfaction of seeing his principles adopted by gynaecological surgeons all over the world.

He was elected to the Council of the College of Surgeons at his second attempt in 1910, and was wont to ascribe his first failure to the fact that he was operating so much at the Chelsea Hospital for Women. The more likely reason was that the President and Vice-President of the College were at that time members of the Middlesex staff, and the *Lancet* was hostile to his election; because Middlesex was such a small school the *Lancet* thought that three of its representatives on the Council was too much of a good thing, but by 1910 the President had retired. It is interesting to note that a quarter of a century later there were three members of the Middlesex staff on the Council; certainly the school had become very much larger.

Bland-Sutton's retirement from Chelsea in 1911 was sudden and perplexing. Having by his work and teaching helped to raise the status of the hospital until it was recognized as being second to

none for the treatment of diseases of women, and the hospital on its part having presented him with the opportunity and facilities for achieving his great position, he refused to be appointed Consulting Surgeon. On the surface such a decision appeared to many to be one of base ingratitude, but the inner history of this refusal was that when he got on the Council of the College of Surgeons and became more intimate with several members thereof, they warned him that he could never hope to be elected President of the College unless he cut himself adrift from a 'Woman's hospital'.

1911 to 1920

In 1912 Bland-Sutton received the honour of Knighthood and in 1914 he was elected President of the Medical Society of London and an LL.D. of Aberdeen University. This was on Thursday, August 10th. We had arranged to visit China and Japan, with our respective wives, starting on August 8th, but the Convocation at Aberdeen University delayed our departure. On his return on the Friday he was very anxious to start, as he thought it would be most interesting to see the mobilization of the German army in case of war, as we passed through on our way to Siberia, and Lady Bland-Sutton undertook to supply packages of food in case of deprivation *en route*. I believe that we might have started on Saturday, August 12th, so intensely interested was Bland-Sutton for a new experience, had not Mr. A. H. Gwynne, the Editor of the *Morning Post*, formerly a celebrated war correspondent, called at Brook Street on the Friday, and, hearing of the project, exclaimed, "For God's sake don't go, you have not the slightest idea of what it all means". Gwynne knew the hardships and difficulties to be met with in a country thus mobilizing. Fortunately, his advice was taken, otherwise we should undoubtedly have all been arrested, our wives sent back to England after many weeks of trials and tribulation, and Bland-Sutton and I would have been incarcerated at Wynberg, where soon all kinds of diseases became rife.

On the declaration of war Bland-Sutton was called up and attached to the 3rd London General Hospital as Captain, a ridiculous rank for a man in his position, and he was soon promoted to Major. The work at this hospital was, however, not congenial to him, more especially as his senior officer did nothing to make the tenure of the rank of Major particularly attractive or

comfortable. After two years service he was made a member of the Special Medical Board at Millbank, and having served on this for a year, he was appointed by the War Office, with the rank of Lieutenant-Colonel, to collect specimens of gun-shot wounds, paying visits to France for this purpose, and the splendid collection he made was eventually entrusted to the College of Surgeons on the same terms as the Hunterian Collection. In 1916 he was appointed Hunterian Professor and in 1917 Bradshaw Lecturer at the College and in 1918 Vice-President of the College. It was in this year that he acted as a special correspondent for the *Morning Post*, going to New York and back in a Destroyer for propaganda purposes, collecting *data* of the records and doings of the Convoy system. In 1920 he was President of the Royal Society of Medicine, and was the first President of the Association of Surgeons of Great Britain and Ireland. His election to this important position came about in this way. Professor Braithwaite, the senior surgeon of the Royal Infirmary, Leeds, who was the first (provisional) secretary of the Association, writes, "Moynihan had a very great opinion of Bland-Sutton, and he thought that if the new Association was to achieve the purpose he (Moynihan) intended, namely that of promoting a liaison between the surgeons of London and those of the Provinces, and of the Provinces between themselves, it would be essential to have as the first President the most popular man he could find in London. It was a very happy decision". It was during this stage that Bland-Sutton reached the pinnacle of his fame as a surgeon, had a very large consulting practice from all parts of the Kingdom and the Colonies, and made his fortune. In 1920, reaching the age-limit, he retired from the Middlesex after 42 years of devoted service.

On the occasion of his last operating day at the Middlesex Hospital the theatre was packed to capacity with colleagues, students and nurses. As he tied the last suture his eyes moistened with tears, which were far from idle, and, while these were chasing each other silently down his cheeks, he turned his back on the patient, walked to the blackboard and wrote thereon:

I feel too sad to talk,
So write my thanks in chalk
Upon the wall.
Nurses well-trained and kind,
Better no man could find.
Farewell all.

1920 to 1931

Continuing to practice, in 1923 Bland-Sutton delivered the Hunterian Oration, and was elected President of the Royal College of Surgeons and an LL.D. of St. Andrews University. In 1924 the LL.D. of the University of Birmingham, the Hon. M.D. of Bordeaux University, and the Knight of Grace of St. John of Jerusalem were conferred on him. In 1925 he received the honour of a Baronetcy, the LL.D. of the University of Glasgow, and finished his third term as a very successful, hard-working and popular President. During his term of office he was largely concerned with the provision of a Supplementary Charter, which gives women Fellows the same privileges as male Fellows. In 1927 he was appointed a Trustee of the Hunterian Museum, delivered the Murphy Oration at Detroit, and had the unique distinction of being made an Hon. Fellow of the American College of Surgeons at the close of the Oration. He was unable to wait for the Convocation next day, as he had to catch a midnight train to Toronto, where he was to represent the English College of Surgeons at the Centenary of the University, at which, having delivered an address, the Hon. Doctor of Science was conferred upon him. In 1928 he was made a Master of Surgery of Dublin University, President of the International Cancer Congress in London, and delivered the Ingleby Lecture at Birmingham. In 1930, on his 75th birthday, a special number of the *British Journal of Surgery* was published in his honour, and contains a coloured reproduction of his portrait by John Collier, now hanging in the Hall of the College of Surgeons. The year 1931 saw the last honour conferred on him, that of the LL.D. of Leeds; in all a truly remarkable testimony to his greatness and unique in the person of any one surgeon. All "outward honours for an inward toil".

It is the experience of most surgeons who retire from their hospital because of the age-limit that the graph of their practice falls with startling rapidity, due mostly to the fact that their junior colleagues forget to mention, in the course of conversation, that the retirement "was only from the hospital". In this Bland-Sutton was a striking exception, and for the ensuing three years his clients kept him almost as busy as ever. His practice then gradually declined, and he performed his last operation, a hysterectomy, on his seventieth birthday.

EPILOGUE.

As a child Bland-Sutton was fond of building castles in the air, but his dreams were "not the children of an idle brain", for in this he differed from others in that he meant to spare no effort to make such castles realities. He was a man of a very determined character, brushing everything aside to attain his object, and was almost Napoleonic mentally, and some thought a little physically. In his later years he used to cut off his telephone at night, as he did not wish to be bothered with trifling things, maintaining that if doctors really required his services they would call and fetch him.

I remember my astonishment when I first came to know him intimately, on his remarking that he was determined to be President of the College of Surgeons, to obtain recognition from the State so that "Surgeon" could be translated into "Sir John", and that he would use all his endeavour to be elected a Fellow of the Royal Society. In the last he was disappointed, a disappointment shared by his intimate friends and colleagues. In 1887, when on his holiday in Paris, he saw at the Louvre a model of the Hall of Honour, built at Susa sometime before 486 B.C. by Darius the Great. Bland-Sutton a few years later told me that he meant to build a reduced replica of this Hall in his own house when opportunity occurred. This idea appeared to me so fantastic that it passed clean out of my mind, but, sure enough, when he took the lease of the house in Brook Street he got into communication with M. Dieulafoy, who had discovered the ruins, and engaged him to reproduce the Hall in minature on the site of the garden behind the house, at enormous expense. During the time he lived in Brook Street this Hall was a source of everlasting pleasure to him, and he was never tired of explaining all its symbols to his friends; he was quite satisfied that 'Sutton's Folly', as he spoke of it to me, was well worth the money he had expended on it so far as he was concerned. Alas! this Āpadāna is now no more, and the magnificent Hall which was so frequently the scene of superb hospitality and which so often resounded with wisdom, wit and laughter was, when taken over by Claridge's Hotel, pounded to dust by the pneumatic drills of the excavator, even as Darius destroyed the walls of Babylon. The Hall is now supplanted by one in which the cacophony of jazz reverberates from its walls, and the ladies and gentlemen disporting themselves therein behave in a way, and discuss subjects, which would have staggered this son of Hystaspes. Yet another example. When the late Duchess of Albany visited the Chelsea Hospital for Women, after its

rehabilitation, Bland-Sutton and I, together with our colleagues, were lined up in the corridor to see her depart. As the Duchess passed by with her *entourage*, Bland-Sutton said to me, "Who is that lady?" I replied, "Miss Edith Heather Bigg, one of the Founders of the Children's Happy Evenings", on which he exclaimed, "I shall marry her". And marry her he did within two months.

Bland-Sutton did not suffer fools gladly, and he entertained much contempt for the young consultant who, with time to spare, neither engaged in writing or research, but "spent his winter evenings sitting by the fire, eating walnuts, sipping port, reading novels, and wondering from whence his next fee was coming". No one was more anxious to attain wealth than Bland-Sutton, but with this ambition he harnessed that of leaving his department of medicine better than he found it, and how completely he succeeded will be found in the books and scientific papers of which he was the author, covering a period of over half a century. His books and papers were always beautifully illustrated because he insisted on Charles Berjeau making the sketches on wood and Frank Butterworth engraving them; consequently he had to pay for them and not the publisher. It was for this reason that he never made much of an income out of his books as such. The first edition of "Tumours" cost him £1,000, so he told me, but he continued, "I got the money back in fees within two months of its publication".

Never one of those who fail to practise what they preach, the following is a list of the number of his addresses and scientific papers published in many journals and of reports of demonstrations at many societies. It does not pretend to be complete, but it includes separate contributions and excludes duplication of the same paper or of reports of the same specimen, and also excludes the many addresses he delivered in Canada, China, India, Japan, and the United States of America, not published in the English journals:

British Medical Journal, 60; *Lancet*, 54; *Transactions of the Pathological Society*, 47; *Clinical Journal*, 44; *Transactions of the Obstetrical Society*, 37; *Journal of Obstetrics and Gynaecology of the British Empire*, 29; *Transactions of the Odontological Society*, 22; *Journal of Anatomy and Physiology*, 18; *Proceedings of the Royal Society of Medicine*, 14; *Transactions of the Clinical Society*, 13; *Transactions of the Medical Society*, 11; *Proceedings of the Zoological Society*, 11; *Transactions of the Medico-Chirurgical Society*, 6; *British Journal of Gynaecology*, 5; *Dental Record*, 4; *British Journal of Dental Science*, 3.

Three hundred and seventy-eight in all. In addition he was the author of the following books:

"Ligaments, their Nature and Morphology" (1887); "Evolution and Disease" (1890); "Surgical Diseases of the Ovaries and Fallopian Tubes" (1891); "Human Osteology in Morris's Anatomy" (1893); "Tumours, Innocent and Malignant" (1893); "Gall Stones and Diseases of the Bile Ducts" (1907); "A Treatise on Fibroids of the Uterus" (1913); "Selected Lectures and Essays" (1920); "The Principles of Doll's Surgery" (Queen Mary's Doll's House Library) (1922); "Orations and Addresses" (1924); and with Arthur Giles "Diseases of Women" (1916).

Bland-Sutton had a host of friends and admirers in every walk of life—Church, Army and Navy, Law, Medicine, Art, Letters, the stage, and so forth. I think, perhaps, his most intimate friends were Rudyard Kipling, who had so much in common with him, Gwynne, Alfred Webb-Johnson, Thomas Rose, Raymond Apperly his anaesthetist, and I venture to include myself. I was on terms of friendship with him from 1888, his private assistant for 15 years, his best man at his second wedding, and his companion on his expedition to East Africa and Uganda to see the source of the Nile. The only way really to know a man is to travel with him, and during those 10 weeks I got to know Bland-Sutton better than I had ever done before or ever did again. A fascinating holiday concerned but little with the killing of animals except to provide the safari of 80 porters with food, and mostly with the observation of glacial erosion, of wild animals, birds, trees, plants, and flowers, the enjoyment of which was perfected by the companionship of one whose sole aim and object seemed to be to ensure my comfort and happiness, and whose knowledge of things in the heavens above, the earth beneath, and the waters under the earth was truly remarkable.

Bland-Sutton was ever kind to those who were kind to him. As he prospered he was the recipient of many requests for loans of money. With recollections of his father, however, his aphorism "he that lends loses not only his money but his friends" remained with him always. Nevertheless he was the fountain of many nameless acts of kindness, and his generosity, on occasions, amounted almost to a vice. He did not let his left hand know what his right hand was doing.

Unlike many successful medical men who have a good bedside manner with but little ability to implement it, Bland-Sutton had all the ability but little of the bedside manner. Always

sympathetic, and with his pleasant and winning smile anxious to do his best for his patients, ordinary mortals did not otherwise claim a great deal of his attention. Conversely, he looked forward to his visits when his patients were clever or original (as, for instance, after he had operated upon Kipling), when he would delay his departure, gaining knowledge, discussing topics which were mutually interesting, and cracking jokes. The visit which amused him more than any other concerned that to a clever young lady from whom he had removed an ovarian teratoma. During her convalescence she demanded to know the nature of her tumour, and at the conclusion of his description, which, I am sure, was given with interesting and amusing detail, she exclaimed, "Then it must have been an immaculate conception".

A good listener, Bland-Sutton was a ready, fluent and entertaining speaker, with a nimble wit, having a remarkable facility for saying quite ordinary things in an extraordinary way. He might have declaimed with Mark Anthony, "I am no orator as Brutus" was, "but, as you know me all, a plain, blunt man". Disdaining flowers of speech, even if he could have culled them, he was indebted to a marvellous memory when sprinkling the wisdom of his remarks with apt quotations from the Bible and Shakespeare, to hesitate now and again with an amusing reminiscence or merry jest. Of late years he was fond of composing doggerel verses which, although they contained illuminating details of natural history, but seldom scanned; and this was curious, which term can also be applied to the fact that he was fond of music, especially that to be heard in cathedrals and churches, although he was tone-deaf and was quite incapable of grasping the melody of "God Save the King" correctly.

He always took the greatest pains with his addresses, which were models of lucidity, and he would search high and low for any interesting details which might have a bearing thereon. His Hunterian Oration was a case in point, in that for a year prior to its delivery he set about visiting the many places connected with the work of John Hunter, one such journey entailing a special visit to an out-of-the-way place in Portugal, where he identified the site of the hospital at which Hunter had worked during the Seven Years War. He never read his addresses, however long, but, having committed them to memory, he would tramp up and down his room delivering the address to an invisible audience till he was word perfect. As a young man the first public address he

was called upon to deliver was the Introductory Address at the commencement of the winter session at the Middlesex, and on his way to the hospital he tore up his manuscript and threw the pieces out of the window of his cab, lest he should be tempted to refer to the manuscript during the course of his address.

Bland-Sutton was always amused at the haberdashery in which the modern surgeon encloses himself when operating, and the *ensemble* when an operation was about to commence reminded him of Holy Week in Seville; doubtless he was thinking of the Nazarinos in the Processiones de Semona Santa. The number of instruments he used for any operation could have been comfortably ensconsed in a young lady's cocktail-bag, in contradistinction to many surgeons, who prefer a receptacle not much smaller than an old salt's sea-chest. He needed fewer instruments than any surgeon I ever saw operate. Serving his apprenticeship in the dawn of antiseptic surgery and being aware of the good results Lawson Tait was obtaining without antiseptics, and also the curious effect on certain physiological functions when the dressers and nurses absorbed too much of the carbolic spray, he pinned his faith to asepsis. Being a man who had eyes in his finger-tips, he objected, at first at anyrate, to having them hoodwinked, and I always felt that he regarded the wearing of rubber gloves more as a hostage to fortune. Since there was a god to propitiate, he insisted on having a brand new pair of gloves for every operation, whether he paid for them himself or not, much to the delight of those nurses who were so fortunate as to possess hands not larger than his, of whom there were not too many.

Within the limitations he set himself Bland-Sutton was a great surgeon, his complete mastery in all circumstances and his apparent nonchalance, though nothing escaped him, always inspired the greatest confidence. Working with a rapidity which deceived the eye, self-reliant to a degree, dexterous, and bold with the power of genius, he was possessed of a courage which dared him to do anything that was feasible and, to paraphrase Lady Macbeth, which he screwed to the sticking-place and did not fail. He was seen at his best in a surgical emergency, and the proverb "That a surgeon must have an eagle's eye, a lion's heart, and a lady's hands" was in him well exemplified. He was indeed a master craftsman.

Bland-Sutton had no respect for authority, and only one hero, John Hunter. His interest in this great man was kindled when,

as a child of 10 years of age, he was taken to see Hunter's house at Earl's Court; it blazed when he came across a dilapidated copy of Ottley's "Life of John Hunter", which he "read with avidity", and thenceforth was never quenched. The two men had everything in common. Baptized with the same Christian name, both sons of farmers, both poor lads to start with who had to work hard to make a living, both had a broad outlook on Nature and were searchers into her secrets. Both combined an all-abiding interest in every form of vegetable and animal life, a peculiar affection for freaks, a relentless acquisitiveness for out-of-the-way objects, and a passion for museums. They both had a great knowledge of anatomy, comparative anatomy, and scientific surgical pathology, and both had a bewildering facility for hard work. Bland-Sutton's reverence for John Hunter culminated in his Hunterian Oration.

They differed in that whereas Hunter was actively engaged in research up to the time of his death, in the case of Bland-Sutton the calls of private practice were such that active research had to be abandoned. Had it been otherwise future generations might have bracketed the name of John Bland-Sutton with that of John Hunter.

Sir John made many generous gifts to the Middlesex Hospital and its Medical School, including the exquisite ambry and piscina, the magnificent font and the beautiful mosaic work in the baptistry of the hospital chapel. It was in 1913 that his most munificent and outstanding gift was made, that of the Pathological Institute which bears his name, a living monument to his life-long contention that pathology forms the basis of all medical teaching and that the path to the highest rungs of the surgical ladder lies through a pathological institute. It was a source of the greatest satisfaction to him that many young surgeons who had worked in his Institute had been elected on to the surgical staff of a hospital.

In 1929 Sir John left Brook Street and took the lease of a house in Hertford Street, where he amused himself in writing "The Story of a Surgeon". In 1930 he started on what was to be his last journey, visiting Canada, China, Japan, Bali, Java, Sumatra, the Malay States, and Siam, and on several occasions was most gratified with the hearty welcome he received from some of his old pupils and friends in the medical profession. Unfortunately, at Batavia he fell ill, being semi-conscious for a few days, the cause of which was never diagnosed.

Returning home in 1931, his good health had deserted him, and it was never the same again. As the evening of his life was drawing to a close his activities and amusements were curtailed by the incidence of diabetes, and thereafter he went out very little and saw only his intimate friends.

In 1933 Sir John took a beautiful house at Kingsdown, which was later purchased. Situated a little way back from the cliff, it had a southern aspect, overlooking "the Goodwins, I think they call the place; a very dangeorous flat and fatal, where the carcases of many a tall ship lie buried". Here he occupied his time in the spring, summer and autumn identifying the ships as they passed in the night and day, examining the heavens through his precious telescope, wandering in his attractive garden, taking motor drives, and receiving a few of his most intimate friends, with whom he would discuss with interest old times, quite oblivious of those of a more recent date. Encouraging a bird sanctuary in a copse near the house, especially did he make friends with two gulls who visited him regularly every day, and who took good care that no other gulls should enjoy the same privilege.

As month after month passed by his health steadily deteriorated, his brain became dulled under the bludgeonings of fate, and he passed away, his life's work well done, on December 20th, 1936, in the eighty-second year of his age. During this sad time he was cared for night and day with the greatest devotion by his wife, who, by his side when his last breath faded, commended his spirit into the hands of the Almighty.

His coffin, covered by the Union Jack, rested in the Chapel he had done so much to beautify until the close of the funeral service, conducted by the Bishop of Willesden. From thence it was transferred to the Hampstead Crematorium, in accordance with his wish expressed on a scrap of paper found in his desk:

> Put me on the kitchen fire,
> And then pull out the damper;
> All that's left of my poor bones
> Will up the chimney scamper.

The "last scene of all that ends this strange eventful history" was a week later, when a Memorial Service was held in Westminster Abbey, conducted by all its clergy, the Lesson being read by the Dean. In addition to Lady Bland-Sutton, Mrs. Septimus Sutton, his sister-in-law, Sir Alfred Webb-Johnson, and Mr. H. A. Gwynne, the large gathering included the President, Vice-Presidents and Members of the Council of the Royal College of

Surgeons and representatives of the Royal College of Physicians, of the Medical Research Council, of the Royal Society of Medicine, of the British Empire Campaign, and members of the Board, Honorary Medical Staff, Medical School, and the Nursing Staff of the Middlesex Hospital. The service closed with a very beautiful rendering of "Crossing the Bar" by the full choir. As the congregation dispersed Swinburne's lines,

> I shall remember while the light lives yet,
> And in the night-time I shall not forget.

reflected the thoughts of many.

In the museum of the Bland-Sutton Institute of Pathology stands a marble bust of the donor by George Frampton, the gift of Lady Bland-Sutton on the completion of the building. During his life-time this bust portrayed an unmistakable replica of the great benefactor to the hospital, in death a startling image.

His ashes are most fittingly enshrined beneath the bust, amidst the evidences of his Great Adventure, and on the pedestal can be read the tribute of Rudyard Kipling, his dearest friend:

JOHN BLAND-SUTTON

A SEEKER AFTER KNOWLEDGE THAT SHOULD
AVERT OR MITIGATE PAIN.

Labouring throughout life to this end,
he gave greatly of his substance that
the search should continue in this place.

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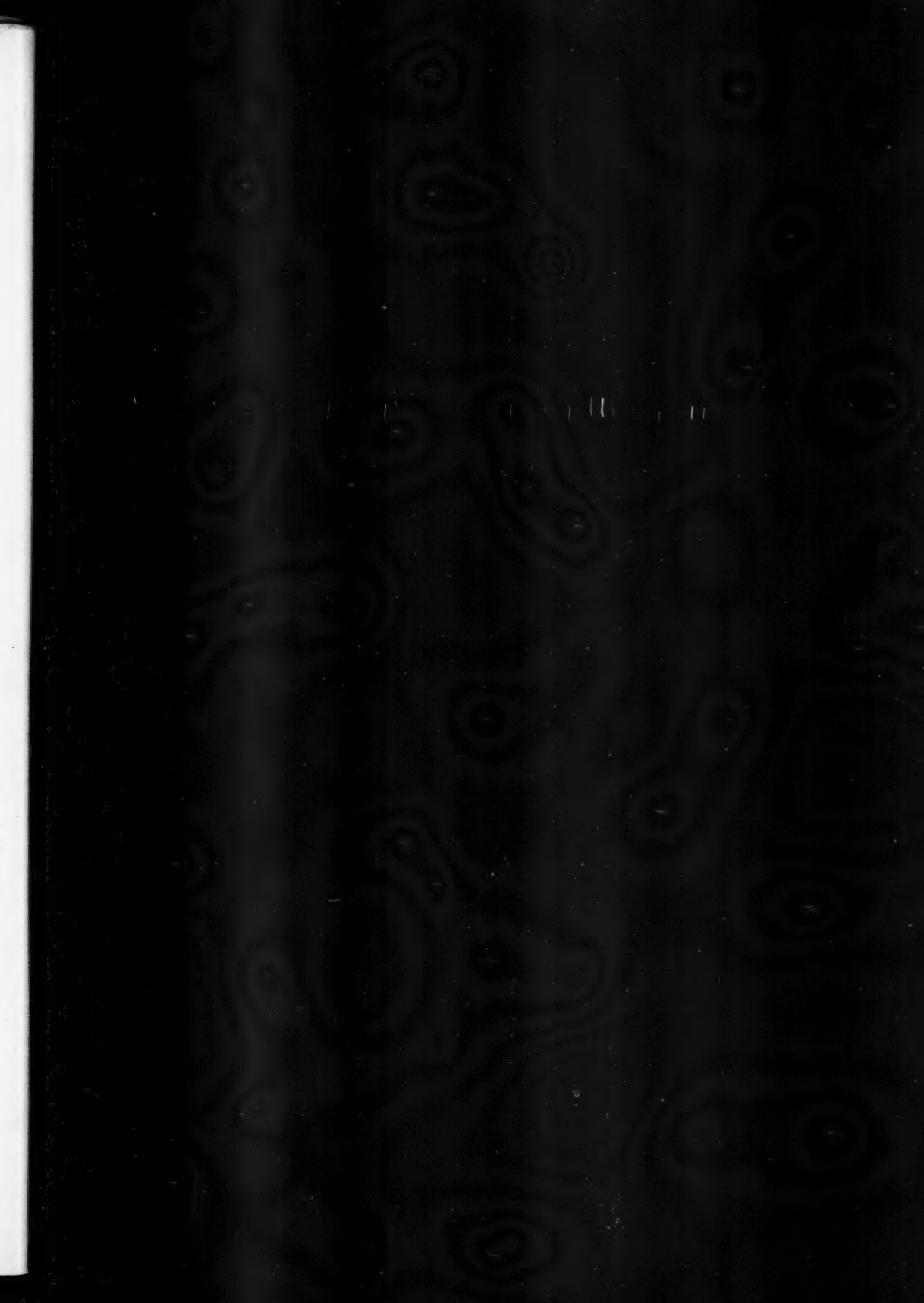

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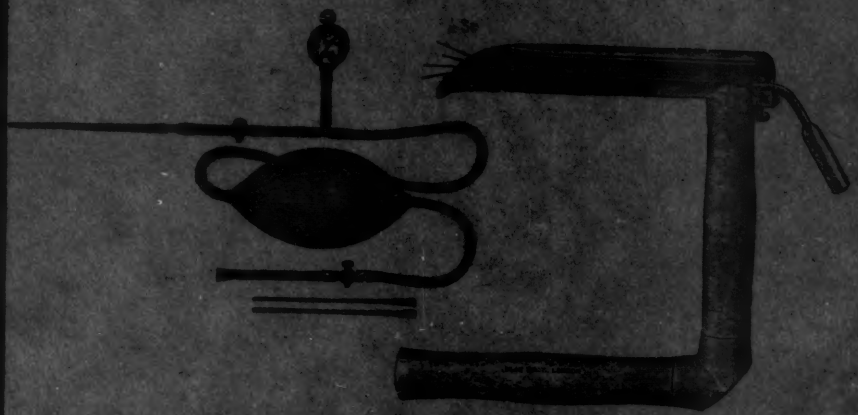

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